55-1520-238-T-2

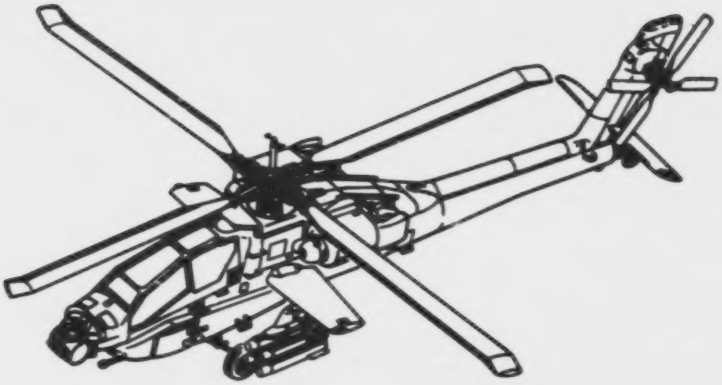
TECHNICAL MANUAL

AVIATION UNIT AND INTERMEDIATE TROUBLESHOOTING MANUAL

FOR

ARMY
AH-64A HELICOPTER

VOLUME 2



This copy is a reprint which includes current pages from Changes 1 through 10.

HEADQUARTERS DEPARTMENT OF ARMY

D 101. 11:

ELECTRICAL SYSTEM

READEX FICHE best copy available

Reproduced from poor document.

CHANGE
NO. 10

Aviation Unit and Intermediate Troubleshooting Manual

For

ARMY MODEL
AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapters 1 through 8, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
9-3 through 9-6	9-3 through 9-6
9-169 and 9-170	9-169 and 9-170

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for AH-64A Helicopter, Attack (APACHE).

TM 55-1520-238-T-2
C 10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 September 1989

CHANGE
NO. 9

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 19 June 1989

Aviation Unit and Intermediate Troubleshooting Manual

For

ARMY MODEL
AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
9-3 and 9-4	9-3 and 9-4
9-9 and 9-10	9-9 and 9-10
9-39 and 9-40	9-39 and 9-40
9-47 and 9-48	9-47 and 9-48
9-109 through 9-116	9-109 through 9-116
-----	9-116.1/9-116.2
9-137 through 9-142.2	9-137 through 9-142.2
-----	9-154.1/9-154.2
9-239 and 9-240	9-239 and 9-240
9-279 and 9-280	9-279 and 9-280
9-309 and 9-310	9-309 and 9-310
9-312.1/9-312.2	9-312.1/9-312.2
9-313 and 9-314	9-313 and 9-314
9-319 and 9-320	9-319 and 9-320
9-331 through 9-334	9-331 through 9-334
9-337 and 9-338	9-337 and 9-338
9-367 through 9-370	9-367 through 9-370
9-375 and 9-376	9-375 and 9-376
9-383 and 9-384	9-383 and 9-384
9-389 and 9-390	9-389 and 9-390
9-395 blank/9-396	9-395 blank/9-396

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for AH-64A Helicopter, Attack (APACHE).

This publication is a repr

CHANGE
NO. 8

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
9-3 through 9-8	9-3 through 9-8
9-155 through 9-158	9-155 through 9-158
- - -	9-168.1/9-168.2
9-191 and 9-192	9-191 and 9-192
9-192.1 and 9-192.2	9-192.1 and 9-192.2
9-193 blank/9-194	9-193 blank/9-194
9-195 and 9-196	9-195 and 9-196
9-199 and 9-200	9-199 and 9-200
9-205 and 9-206	9-205 and 9-206
- - -	9-206.1 blank/9-206.2
9-263 through 9-266	9-263 through 9-266
- - -	9-266.1 and 9-266.2
9-273 and 9-274	9-273 and 9-274

2. Retain this sheet in front of manual for reference purposes.

nt of TM 55-1520-238-T-2, Volume 2 Change 8

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 30 January 1989

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

WILLIAM J. MEEHAN II
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE
No. 7

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
9-3 through 9-12	9-3 through 9-12
9-169 and 9-170	9-169 and 9-170
---	9-170.1 and 9-170.2
9-171 and 9-172	9-172
9-173 through 9-180	9-173 through 9-180
9-189 and 9-190	9-189 and 9-190
---	9-190.1/9-190.2
9-191 and 9-192	9-191 and 9-192
9-205 through 9-210	9-205 through 9-210
9-216	9-215 and 9-216
9-223 through 9-228	9-223 through 9-228
9-231 and 9-232	9-231/9-232
---	9-232.1 and 9-232.2
9-233 and 9-234	9-233 and 9-234
9-238	9-237 and 9-238

2. Retain this sheet in front of manual for reference purposes.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 17 November 1988

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM Maintenance requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE }
No. 6 }

Aviation Unit and Intermediate
Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
9-21 through 9-24	9-21 through 9-24
9-29 through 9-32	9-29 through 9-32
9-38	9-38
9-39 and 9-40	9-39 and 9-40
9-53 and 9-54	9-53 and 9-54
9-71 through 9-80	9-71 through 9-80
9-93 and 9-94	9-93 and 9-94
9-97 and 9-98	9-97 and 9-98
9-98.1/9-98.2	9-98.1/9-98.2
9-99 and 9-100	9-99 and 9-100
9-109 and 9-110	9-109 and 9-110
9-121 and 9-122	9-121 and 9-122
9-169 and 9-170	9-169 and 9-170
9-396 through 9-404	9-396 through 9-404
9-407 and 9-408	9-407 and 9-408

2. Retain this sheet in front of manual for reference purposes.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 August 1988

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter.

CHANGE
NO. 5

Aviation Unit and Intermediate
Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
9-1 through 9-10	9-1 through 9-10
9-85 through 9-92	9-85 through 9-92
9-99 through 9-106	9-99 through 9-106
9-113 and 9-114	9-113 and 9-114
9-123 through 9-128	9-123 through 9-128
---	9-128.1/9-128.2
9-129 through 9-132	9-129 through 9-132
---	9-132.1 blank/9-132.2
9-133 through 9-138	9-133 through 9-138
9-141 and 9-142	9-141 and 9-142
---	9-142.1 and 9-142.2
9-143 and 9-144	9-143 blank/9-144
9 153 and 9-154	9-153 and 9-154
9-191 and 9-192	9-191 and 9-192
---	9-192.1 and 9-192.2
9-193 and 9-194	9-193 blank/9-194
9-195 through 9-200	9-195 through 9-200
9-231 and 9-232	9-231 and 9-232
9-275 through 9-278	9-275 through 9-278
9-309 and 9-310	9-309 and 9-310
9-335 through 9-340	9-335 through 9-340
9-357 through 9-362	9-357 through 9 362

2. Retain this sheet in front of manual for reference purposes.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 8 December 1987

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE
NO. 4

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
9-1 through 9-12	9-1 through 9-12
9-35 blank/9-36	9-35 blank/9-36
---	9-36.1 through 9-36.4
9-37 and 9-38	9-37 blank/9-38
9-39 through 9-44	9-39 through 9-43/9-44
9-45 blank/9-46	9-45 and 9-46
9-47 through 9-54	9-47 through 9-54
9-55 through 9-60	---
9-61 and 9-62	9-61 blank/9-62
9-63 and 9-64	9-63 and 9-64
9-155 through 9-160	9-155 through 9-160
9-169 through 9-176	9-169 through 9-176
9-179 through 9-182	9-179 through 9-181/9-182
9-205 through 9-212	9-205 through 9-212
9-223 through 9-228	9-223 through 9-228
9-233 and 9-234	9-233 and 9-234
9-237 blank/9-238	9-237 blank/9-238
9-239 through 9-255/9-256	9-239 through 9-256
9-275 through 9-284	9-275 through 9-284
9-302.1/9-302.2	9-302.1/9-302.2
9-309 through 9-312	9-309 through 9-312
---	9-312.1/9-312.2

2. Retain this sheet in front of manual for reference purposes.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 31 August 1987

By Order of the Secretary of the Army:

CARL E. VUONO
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE
NO. 3

Aviation Unit and Intermediate
Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
i/ii	i/ii
---	9-12.1 Blank/9-12.2
9-13 through 9-20	9-13 through 9-20
9-37 and 9-38	9-37 and 9-38
9-41 and 9-42	9-41 and 9-42
9-47 through 9-52	9-47 through 9-52
9-103 through 9-106	9-103 through 9-106
9-169 and 9-170	9-169 and 9-170
9-225 through 9-232	9-225 through 9-232
9-255 and 9-256	9-255/9-256
9-257 and 9-258	9-257 and 9-258
9-275 through 9-282	9-275 through 9-282
---	9-302.1/9-302.2
9-329 through 9-332	9-329 through 9-332
9-337 and 9-338	9-337 and 9-338
9-365 through 9-370	9-365 through 9-370
9-383 and 9-384	9-383 and 9-384
9-397 and 9-398	9-397 and 9-398

2. Retain this sheet in front of manual for reference purposes

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 20 May 1987

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE }
NO. 2 }

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
-----	i/ii
9-11 and 9-12	9-11 and 9-12
9-39 and 9-40	9-39 and 9-40
9-157 and 9-158	9-157 and 9-158
9-169 through 9-172	9-169 through 9-172
9-329 through 9-332	9-329 through 9-332
9-365 through 9-370	9-365 through 9-370
9-383 and 9-384	9-383 through 9-384.1/9-384.2
9-385 and 9-386	9-385 and 9-386
9-393 through 9-400	9-393 through 9-400
9-409/9-410	9-409/9-410

2. Retain this sheet in front of manual for reference purposes.

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 8 April 1987

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:

To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

CHANGE
No. 1

Aviation Unit and Intermediate Troubleshooting Manual

AH-64A HELICOPTER

VOLUME 2

TM 55-1520-238-T-2, Chapter 9, 15 December 1985, is changed as follows:

1. Remove and insert pages as indicated below. New or changed text material is indicated by a vertical bar in the margin. An illustration change is indicated by a miniature pointing hand.

Remove pages	Insert pages
-----	i/ii
9-23 and 9-24	9-23 and 9-24
9-27 and 9-28	9-27 and 9-28
9-31 and 9-32	9-31 and 9-32
9-37 and 9-38	9-37 and 9-38
9-51 thru 9-60	9-51 thru 9-60
9-67 and 9-68	9-67 and 9-68
9-69/9-70	9-69/9-70
9-77 thru 9-82	9-77 thru 9-82
9-85 and 9-86	9-85 and 9-86
9-89 thru 9-92	9-89 thru 9-92
-----	9-92.1/9-92.2
9-97 and 9-98	9-97 and 9-98
-----	9-98.1/9-98.2
9-99 and 9-100	9-99 and 9-100
9-103 thru 9-108	9-103 thru 9-108
9-113 thru 9-122	9-113 thru 9-122
9-125 thru 9-128	9-125 thru 9-128
9-131 and 9-132	9-131 and 9-132
9-147 thru 9-154	9-147 thru 9-154
9-161 thru 9-168	9-161 thru 9-168
9-171 and 9-172	9-171 and 9-172
9-183 thru 9-192	9-183 thru 9-192
9-197 thru 9-206	9-197 thru 9-206
9-211 thru 9-214	9-211 thru 9-214
9-215/9-216	9-215/9-216
9-219 and 9-220	9-219 and 9-220
9-223 thru 9-224	9-299 thru 9-224
9-229 thru 9-232	9-229 thru 9-232
9-235 and 9-236	9-235 and 9-236
9-237/9-238	9-237/9-238
9-245 thru 9-251	9-245 thru 9-251
9-259 thru 9-262	9-259 thru 9-262
9-265 thru 9-276	9-265 thru 9-276
9-285 thru 9-304	9-285 thru 9-304

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 2 September 1986

Remove pages	Insert pages
9-307 thru 9-318	9-307 thru 9-318
9-325 and 9-326	9-325 and 9-326
9-327/9-328	9-327/9-328
9-337 and 9-338	9-337 and 9-338
9-343 thru 9-362	9-343 thru 9-362
9-367 and 9-368	9-367 and 9-368
9-373 and 9-374	9-373 and 9-374
-----	9-374.1/9-374.2
9-375 thru 9-392	9-375 thru 9-392
9-397 and 9-398	9-397 and 9-398
9-401 thru 9-408	9-401 thru 9-408
9-409/9-410	9-409/9-410
Cover 1/2	Cover 1/2

2. Retain this sheet in front of manual for reference purposes.

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

R. L. DILWORTH
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

AH 64A EFFECTIVITY CODES

Refer to Volume 1 HOW TO USE THIS VOLUME for an explanation of the AH-64A Helicopter Effectivity codes.

Code	Helicopter Serial No.
AAA	82-23355 through 83-23814.
AAB	83-23815 and subsequent.
AAC	82-23355 through 83-23804.
AAD	83-23805 and subsequent.
AAF	83-23828 through 84-24209.
AAG	84-24212 and subsequent.
AAH	82-23355 through 82-23361.
AAJ	82-23362 through 83-23814.
AAK	82-23362 and subsequent.
AAP	82-23355 through 84-24241.
AAQ	84-24242 and subsequent.
AAT	82-23355 through 82-23364, 83-23787. 83-23789 through 83-23797, 83-23799 through 83-23810, 83-23812 through 83-23814, 83-23816 through 83-23826.
AAU	82-23365, 83-23788, 83-23798, 83-23811, 83-23815, 83-23827 and subsequent.
AAV	82-23355 through 82-23365.
AAW	83-23787 and subsequent.
ABH	82-23355 through 84-24289.
ABI	84-24290 and subsequent.

Code	Helicopter Serial No.
ABJ	82-23355 through 85-25488.
ABK	86-8940 and subsequent.
ABL	83-23815 through 84-24207, 86-8940 and subsequent.
ABM	82-23355 through 83-23814, 84-24208 and subsequent.
ABN	83-23815 through 84-24207.
ABO	82-23355 through 84-24311.
ABP	85-25351 and subsequent.
ABQ	82-23355 through 83-23798.
ABR	83-23799 and subsequent.
ABS	82-23355 through 84-24245.
ABT	83-23799 through 84-24245.
ABU	84-24246 and subsequent.
ABV	82-23355 through 85-25398
ABW	85-25399 and subsequent.

CHAPTER OVERVIEW

Chapter 9 contains the operational check and fault isolation procedures required for troubleshooting the electrical system.

Electrical system maintenance information is in TM 55-1520-238-23.

Chapter 9 is divided into the following sections:

	Para	Title
Section I	9-1-1	Failure Symptom List
Section II consists of the following troubleshooting procedures for AC Electrical Generation:		
	9-2-1	AC Electrical Power Generation - FD/LS Check
	9-2-2	AC Electrical Power Generation - Operational Check
Section III	9-3-1	DC Electrical Power Generation - Operational Check
Section IV	9-4-1	Battery - Operational Check
Section V	9-5-1	External Power and Ground Service Utility Receptical- Operational Check
Section VI	9-6-1	Navigation Lights - Operational Check
Section VII	9-7-1	Formation Lights - Operational Check
Section VIII	9-8-1	Anti-Collision Lights - Operational Check
Section IX	9-9-1	Landing/Search Light - Operational Check
Section X	9-10-1	Maintenance Lights - Operational Check
Section XI	9-11-1	Pilot Utility and Secondary Lights - Operational Check
Section XII	9-12-1	CPG Utility and Secondary Lights - Operational Check
Section XIII	9-13-1	Pilot Edge-Light - Operational Check
Section XIV	9-14-1	CPG Edge-Light - Operational Check
Section XV	9-15-1	Circuit Breaker Reference List
	9-15-2	Pilot Circuit Breaker Panel - Accessing, Securing Procedure
Section XVI	9-16-1	Circuit Protection System (AC Essential Bus 1 Pilot Station) - Operational Check
Section XVII	9-17-1	Circuit Protection System (AC Essential Bus 1 - CPG Station) - Operational Check
Section XVIII	9-18-1	Circuit Protection System (AC Essential Bus 2 - Pilot Station) - Operational Check
Section XIX	9-19-1	Circuit Protection System (AC Essential Bus 2 - CPG Station) - Operational Check
Section XX	9-20-1	Circuit Protection System (DC Essential Bus 1 - Pilot Station) - Operational Check
Section XXI	9-21-1	Circuit Protection System (DC Essential Bus 1 - CPG Station) - Operational Check
Section XXII	9-22-1	Circuit Protection System (DC Essential Bus 2 - Pilot Station) - Operational Check
Section XXIII	9-23-1	Circuit Protection System (DC Essential Bus 3 - Pilot Station) - Operational Check
Section XXIV	9-24-1	Circuit Protection System (DC Essential Bus 3 - CPG Station) - Operational Check
Section XXV	9-25-1	Circuit Protection System (DC Emergency Bus - Pilot Station) - Operational Check
Section XXVI	9-26-1	Circuit Protection System (DC Emergency Bus - CPG Station) - Operational Check
Section XXVII	9-27-1	Circuit Protection System (DC Ground Circuit Breakers - Pilot Station) - Operational Check
Section XXVIII	9-28-1	Circuit Protection System (DC Ground Circuit Breakers - CPG Station) - Operational Check
Section XXIX	9-29-1	Circuit Breaker Edge-Light Panel - Operational Check
Section XXX	9-30-1	Pilot and CPG Caution/Warning Panels-Indicators Functional Data
Section XXXI	9-31-1	Pilot Caution and Warning System - Operational Check
Section XXXII	9-32-1	CPG Caution and Warning System - Operational Check
Section XXXIII	9-33-1	Audio Warning System - Operational Check

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST

Symptom	Go to Para
A. AC Electrical Power Generation - Operational Check:	
1. **GEN 2** indicator is not lighted with generator No. 2 off line.	9-2-2
2. **GEN 1** indicator is lighted.	9-2-2
3. **GEN 2** indicator is lighted.	9-2-2
4. **GEN 1** indicator is not lighted with generator No. 1 off line.	9-2-2
5. **ELEC PWR** panel edge-light - does not light.	9-2-2
6. With **GEN 1** switch in **GEN 1** position - **GEN 1** indicator is lighted.	9-2-2
7. With **GEN 2** switch in **GEN 2** position - **GEN 2** indicator is lighted.	9-2-2
8. **RECT 1** indicator - is lighted with **GEN 1** switch **OFF**.	9-2-2
9. **RECT 2** indicator - is lighted with **GEN 2** switch **OFF** and **GEN 1** switch at **GEN 1**.	9-2-2
B. DC Electrical Power Generation - Operational Check:	
1. Power is not available to all DC essential bus No. 1 circuit breakers.	9-3-1
2. Power is not available to all DC essential bus No. 2 circuit breakers.	9-3-1
3. **POWER XFMR RECT 1** circuit breaker (CB1) - does not stay closed.	9-3-1
4. **POWER XFMR RECT 2** circuit breaker (CB4) - does not stay closed.	9-3-1
5. **RECT 1** indicator on pilot caution/warning panel - lights.	9-3-1
6. **RECT 2** indicator on pilot caution/warning panel - lights.	9-3-1
7. **POWER XFMR RECT 1** and **POWER XFMR RECT 2** circuit breakers - do not stay closed.	9-3-1
8. Power is not available to all DC emergency bus circuit breakers.	9-3-1
9. No continuity between W1 and TB1-1-D.	9-3-1
10. DC essential bus No. 1 - has no power.	9-3-1
11. DC essential bus No. 2 - has no power.	9-3-1
12. No continuity between W2 and TB1-1-D.	9-3-1
13. Power is not available to all DC essential bus No. 3 circuit breakers.	9-3-1

	Symptom	Go to Para
14.	**HOT RECT 1** indicator - is lighted.	9-3-1
15.	**HOT RECT 2** indicator - is lighted.	9-3-1
16.	**RECT 1** indicator - is not lighted.	9-3-1
17.	**RECT 2** indicator - is not lighted.	9-3-1
C.	Battery - Operational Check:	
1.	Battery - does not come on line.	9-4-1
2.	Caution/warning indicators - are illuminated with power off and battery connected.	9-4-1
D.	External Power and Ground Service Utility Receptacle - Operational Check:	
1.	External power - does not come through external power contactor.	9-5-1
2.	GEN 1 contactor - does not close with external power applied.	9-5-1
3.	Ground utility service receptacle - does not have AC power.	9-5-1
4.	Ground service utility receptacle - does not have DC power.	9-5-1

	Symptom	Go to Para
5.	**EXT PWR** indicator - is not lighted when external power access door is open.	9-5-1
6.	**EXT PWR** indicator - is lighted when external power access door is closed.	9-5-1
7.	Electrical power - does not come on after **EXT PWR RESET** button has been depressed.	9-5-1
E.	Navigation Lights - Operational Check:	
1.	All navigation lights - do not function.	9-6-1
2.	**LT NAV** circuit breaker (CB73) - does not stay closed.	9-6-1
3.	Left navigation light - does not function.	9-6-1
4.	Right navigation light - does not function.	9-6-1
5.	Tail navigation light - does not function.	9-6-1
F.	Formation Lights - Operational Check:	
1.	**LT FORM** circuit breaker (CB90) - does not stay closed.	9-7-1
2.	All formation lights - do not function.	9-7-1
3.	Left wing formation light - does not function.	9-7-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
F. Formation Lights - Operational Check (cont):	
4. Right wing formation light - does not function.	9-7-1
5. Tail formation light - does not function.	9-7-1
6. Fuselage formation light - does not function.	9-7-1
G. Anti-Collision Lights - Operational Check:	
1. Red anti-collision lights - do not function.	9-8-1
2. White anti-collision lights - do not function.	9-8-1
3. **LT ANTI COL** circuit breaker (CB40) - does not stay closed.	9-8-1
4. **LT NAV** circuit breaker (CB73) - does not stay closed.	9-8-1
5. Left wing red anti-collision light - does not function.	9-8-1
6. Right wing red anti-collision light - does not function.	9-8-1
7. Left wing white anti-collision light - does not function.	9-8-1
8. Right wing white anti-collision light - does not function.	9-8-1

Symptom	Go to Para
H. Landing/Search Light - Operational Check:	
1. **LT SRCH/LDG** circuit breaker (CB22) - does not stay closed.	9-9-1
2. **LT SRCH/LDG CONTR** circuit breaker (CB80) - does not stay closed.	9-9-1
3. Pilot collective stick - does not extend landing/search light.	9-9-1
4. Pilot collective stick - does not rotate landing/search light to the left.	9-9-1
5. Pilot collective stick - does not activate landing/search light.	9-9-1
6. Pilot collective stick - does not rotate landing/search light to the right.	9-9-1
7. Pilot collective stick - does not retract landing/search light.	9-9-1
8. Pilot collective stick - does not stow landing/search light.	9-9-1
9. Pilot collective stick edge-light - is not lighted.	9-9-1
10. CPG collective stick - does not extend landing/search light.	9-9-1
11. CPG collective stick - does not rotate landing/search light to left.	9-9-1

Symptom	Go to Para
12. CPG collective stick - does not rotate landing/search light to right.	9-9-1
13. CPG collective stick - does not activate landing/search light.	9-9-1
14. CPG collective stick - does not retract landing/search light.	9-9-1
15. CPG collective stick - does not stow landing/search light.	9-9-1
16. CPG collective stick edge-light - is not lighted.	9-9-1
I. Maintenance Lights - Operational Check:	
1. **MAINT LT** circuit breaker (CB8) - does not stay closed.	9-10-1
2. Maintenance light - does not operate in aft avionics bay.	9-10-1
3. Maintenance light - does not operate in right forward avionics bay.	9-10-1
J. Pilot Utility and Secondary Lights - Operational Check:	
1. **LT UTIL SEC** circuit breaker (CB23) - does not stay closed.	9-11-1
2. One or more pilot secondary lights - do not light.	9-11-1
3. Pilot utility light - does not light.	9-11-1
K. CPG Utility and Secondary Lights - Operational Check:	
1. **EMERG BATT UTIL SEC LT** circuit breaker (CB30) - does not stay closed.	9-12-1
2. One or more CPG secondary lights - do not light.	9-12-1
3. CPG utility light - does not light.	9-12-1
L. Pilot Edge-Light - Operational Check:	
1. Pilot **LT PRI** circuit breaker (CB39) - does not stay closed.	9-13-1
2. All pilot left console edge-lighted panels - do not light.	9-13-1
3. All pilot right and center console edge-lighted panels - do not light.	9-13-1
4. All pilot instrument edge-lighted panels - do not light.	9-13-1
5. All Ch. 1 No. 1 edge-lighted panels - do not light.	9-13-1
6. All Ch. 1 No. 2 edge-light panels - do not light.	9-13-1
7. All Ch. 2 No. 1 edge-light panels - do not light.	9-13-1
8. All Ch. 2 No. 2 edge-light panels - do not light.	9-13-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
L. Pilot Edge-Light - Operational Check (cont):	
9. All Ch. 2 No. 3 edge-light panels - do not light.	9-13-1
10. All Ch. 3 No. 1 edge-light panels - do not light.	9-13-1
11. All Ch. 3 No. 2 edge-light panels - do not light.	9-13-1
12. All Ch. 3 No. 3 edge-light panels - do not light.	9-13-1
13. All Ch. 4 No. 1 edge-light panels - do not light.	9-13-1
14. All Ch. 4 No. 2 edge-light panels - do not light.	9-13-1
15. All Ch. 4 No. 4 edge-light panels - do not light.	9-13-1
16. EXT LT/INTR LT edge-light - does not light.	9-13-1
17. All pilot edge-lights - are not lighted.	9-13-1
M. CPG Edge-Light - Operational Check:	
1. CPG PRI LT circuit breaker (CB14) - does not stay closed.	9-14-1
2. All CPG left console edge-lighted panels - do not light.	9-14-1
3. All CPG right console edge-lighted panels - do not light.	9-14-1

Symptom	Go to Para
4. All CPG instrument edge-lighted panels - do not light.	9-14-1
5. All Ch. 1 No. 1 edge-light panels - do not light.	9-14-1
6. All Ch. 1 No. 2 edge-light panels - do not light.	9-14-1
7. All Ch. 2 No. 1 edge-light panels - do not light.	9-14-1
8. All Ch. 3 No. 1 edge-light panels - do not light.	9-14-1
9. All Ch. 3 No. 2 edge-light panels - do not light.	9-14-1
10. All Ch. 4 No. 1 edge-light panels - do not light.	9-14-1
11. All Ch. 4 No. 2 edge-light panels - do not light.	9-14-1
12. All Ch. 4 No. 3 edge-light panels - do not light.	9-14-1
13. CPG INTR LT panel edge-light - does not light.	9-14-1
14. All CPG edge-lights - are not lighted.	9-14-1
N. Circuit Breaker Reference List.	9-15-1

9-1-1

Symptom	Go to Para
0. Circuit Protection System (AC Essential Bus 1-Pilot Station) - Operational Check:	
1. A short exists between ground and A76P3-G, -H, -J; A76P3-K, -L, -M: or A76P3-N, -P, -R.	9-16-1
2. **MISSION PNVS AC** circuit breaker (CB81) - does not stay closed or 115 VAC to PNVS is not present at A76P2-N, -P, -R.	9-16-1
3. **MISSION IHADSS** circuit breaker (CB41) - does not stay closed or 115 VAC to IHADSS is not present at A76P1-11, -12, -13.	9-16-1
4. **MISSION RDR JAM AC** circuit breaker (CB74) - does not stay closed or 115 VAC to radar jammer is not present at A76P1-5, -6, -7.	9-16-1
5. **NAV AIR DATA AC** circuit breaker (CB84) - does not stay closed or 115 VAC to OAS is not present at A76P2-H, -G, -F.	9-16-1
6. **NAV HARS AC** circuit breaker (CB42) - does not stay closed or 115 VAC to HARS is not present at A76P1-38, -39, -40.	9-16-1
7. **MISSION SYM GEN** circuit breaker (CB45) - does not stay closed or 115 VAC to symbol generator is not present at A76P1-52.	9-16-1
8. **LT PRI** circuit breaker (CB39) - does not stay closed or 115 VAC to multi-channel dimming controller - is not present at A76P1-45.	9-16-1
9. **LT ANTI COL** circuit breaker (CB40) - does not stay closed or 115 VAC to anti-collision lights is not present at A76P1-44.	9-16-1
10. **LT FORM** circuit breaker (CB90) - does not stay closed or 115 VAC to formation lights is not present at A76P1-24.	9-16-1
11. **NAV HSI** circuit breaker (CB43) - does not stay closed or 115 VAC to horizontal situation indicator is not present at A76P1-26.	9-16-1
12. **ASE AC** circuit breaker (CB18) - does not stay closed or 115 VAC to ASE actuators is not present at A76P1-54.	9-16-1
13. **MISSION EL AC** circuit breaker (CB92) - does not stay closed or 115 VAC to stores elevation controller is not present at A76P1-30.	9-16-1
14. **MISSION FC AC** circuit breaker (CB51) - does not stay closed or 115 VAC to power supply is not present at A76P1-28.	9-16-1
15. **ECS L NOSE GRBX HTR** circuit breaker (CB38) - does not stay closed or 115 VAC is not present at A76P2-m, -n, -p.	9-16-1
16. **POWER XFMR RECT 1** circuit breaker (CB1) - does not stay closed or continuity to XFMR RECT No. 1 does not exist between A76P3-K and -S, -L and -T, -M and -U.	9-16-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
O. Circuit Protection System (AC Essential Bus 1-Pilot Station) - Operational Check (cont):	
17. POWER ENG 1 circuit breaker (CB62) - does not stay closed or 115 VAC to engine 1 power transformer is not present at P76P1-22.	9-16-1
18. STAB AUTO AC circuit breaker (CB2) - does not stay closed or 115 VAC to stabilator control unit is not present at P76P1-36.	9-16-1
19. STAB MAN AC circuit breaker (CB7) - does not stay closed or 115 VAC to stabilator position indicator is not present at P76P1-37.	9-16-1
20. ECS R NOSE GRBX HTR circuit breaker (CB211) - does not stay closed or 115 VAC is not present at A76P2-q, -r, -s.	9-16-1
P. Circuit Protection System (AC Essential Bus 1-CPG Station) - Operational Check:	
1. Short exists between ground and P461-D, -E or -F.	9-17-1
2. 115 VAC - is not present at P767-30, -31, or 115 VAC is not present at P767-31.	9-17-1
3. Short exists between ground and P461-L.	9-17-1
4. AWS AWS AC circuit breaker (CB11) - does not stay closed or continuity to gun and turret control boxes does not exist between A77J4-L and A77J2-12, -19.	9-17-1
5. MSL R OUTBD LCHR AC circuit breaker (CB18) - does not stay closed or continuity to missile launcher 4 does not exist between A77J2-5 and -31.	9-17-1
6. MSL R INBD LCHR AC circuit breaker (CB21) - does not stay closed or continuity to missile launcher 3 does not exist between A77J2-31 and -4.	9-17-1
7. MSL L INBD LCHR AC circuit breaker (CB24) - does not stay closed or continuity to missile launcher 2 does not exist between A77J2-31 and -3.	9-17-1

Symptom	Go to Para
8. **MSL L OUTBD LCHR AC** circuit breaker (CB26) - does not stay closed or continuity to missile launcher 1 does not exist between A77J2-31 and -2.	9-17-1
9. **FC FCC AC** circuit breaker (CB16) - does not stay closed or continuity to **FIRE CONTROL** panel does not exist between A77J2-30 and -35.	9-17-1
10. **ATTD IND** circuit breaker (CB20) - does not stay closed or continuity to remote attitude indicator does not exist between A77J2-30 and A77J1-6.	9-17-1
11. **LASER** circuit breaker (CB4) - does not stay closed or 115 VAC to laser electronic unit is not present at A97J1-A, -B, -D.	9-17-1
12. **TADS AC** circuit breaker (CB3) - does not stay closed or 115 VAC to TADS power supply and ORT is not present at A97J1-H, -F, -E.	9-17-1
13. **IHADSS** circuit breaker (CB1) - does not stay closed or 115 VAC to IHADSS SEU is not present at A97P1-E, -D, -C.	9-17-1
14. Continuity does not exist between A77J4-L and A77J2-35.	9-17-1
15. Continuity does not exist between A77J4-L and A77J1-6.	9-17-1
Q. Circuit Protection System (AC Essential Bus 2-Pilot Station) - Operational Check:	
1. A short exists between ground and A76P3-D, -E, -F or A76P4-A, -B, -C.	9-18-1
2. **POWER XFMR RECT 2** circuit breaker (CB4) - does not stay closed or continuity to XFMR RECT No. 2 does not exist between P4-A and -D, -B and -E, -C and -F.	9-18-1
3. **ECS CANOPY ANTI ICE** circuit breaker (CB78) - does not stay closed or 115 VAC to canopy temperature control is not present at P2-c, -d, -e.	9-18-1
4. **ECS AFT FAN** circuit breaker (CB75) - does not stay closed or 115 VAC to electrical power center and aft avionics fans is not present at P2-A, -B, -C.	9-18-1
5. **ECS ICE DET HTR** circuit breaker (CB212) - does not stay closed or 115 VAC is not present at A76P1-9.	9-18-1
6. **ECS FAB FAN** circuit breaker (CB88) - does not stay closed or 115 VAC to FAB fan relays is not present at P2-K, -L, -M.	9-18-1
7. **POWER ENG 2** circuit breaker (CB44) - does not stay closed or 115 VAC to engine No. 2 power transformer is not present at P1-23.	9-18-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
8. **POWER BATT CHGR AC** circuit breaker (CB86) - does not stay closed or 115 VAC to battery charger and heater is not present at P1-35.	9-18-1
R. Circuit Protection System (AC Essential Bus 2 - CPG Station) - Operational Check:	
1. 115 VAC - is not present at P769-H, -B, -E.	9-19-1
2. **AWS MTR** circuit breaker (CB3) - does not stay closed or continuity to gun control box does not exist between J4-H and J3-4, J4-B and J3-5, J4-E and J3-6.	9-19-1
3. **AWS AMMO** circuit breaker (CB7) - does not stay closed or continuity to downloader and rounds counter does not exist between J4-H and J2-1, J4-B and J2-15, J4-E and J2-22.	9-19-1
4. **FC RC DR** circuit breaker (CB8) - does not stay closed or continuity to video recorder does not exist between J4-E and J2-16.	9-19-1
5. **PRI LT** circuit breaker (CB14) - does not stay closed or continuity to multi-channel dimming controller does not exist between J4-H and J1-9.	9-19-1
S. Circuit Protection System (DC Essential Bus 1 - Pilot Station) - Operational Check:	
1. A short exists between ground and A76P4-M or -N.	9-20-1
2. **STAB MAN DC** circuit breaker (CB6) - does not stay closed or 28 VDC to stabilator relay panel is not present at A76P2-g.	9-20-1
3. **ECS CANOPY ANTI ICE CONTR** circuit breaker (CB70) - does not stay closed or 28 VDC to **ANTI ICE** panel is not present at A76P1-3.	9-20-1
4. **ECS WSHLD WPR** circuit breaker (CB71) - does not stay closed or 28 VDC to windshield wiper motors is not present at A76P2-b.	9-20-1
5. **ECS ENG ANTI ICE** circuit breaker (CB67) - does not stay closed or 28 VDC to **ANTI ICE** panel is not present at A76P1-4.	9-20-1
6. **POWER BATT CHGR DC** circuit breaker (CB5) - does not stay closed or 28 VDC to battery charger is not present at A76P2-a.	9-20-1
7. Pilot **CBR BLWR** circuit breaker (CB94) - does not stay closed or 28 VDC is not present between P993-A and P993-B.	9-20-1
T. Circuit Protection System (DC Essential Bus 1 - CPG Station) - Operational Check:	
1. 28 VDC is not present at P763-D.	9-21-1

Symptom	Go to Para
2. **TADS DC** circuit breaker (CB2) - does not stay closed or 28 VDC to TADS/PNVS turret is not present at A97J1-M, -L, -G, -C.	9-21-1
3. CPG **CBR BLWR** circuit breaker (CB5) - does not stay closed or 28 VDC is not present between P997-A and P997-B.	9-21-1
U. Circuit Protection System (DC Essential Bus 2 - Pilot Station) - Operational Check:	
1. A short exists between ground and A76P4-J or G.	9-22-1
2. **MISSION ARM CONTR** circuit breaker (CB46) - does not stay closed or 28 VDC to ground maintenance switch is not present at P2-E.	9-22-1
3. **IR JAM XMTR** circuit breaker (CB66) - does not stay closed or 28 VDC to IR jammer control is not present at A76P2-h.	9-22-1
4. **MISSION PEN AIDS CONTR** circuit breaker (CB49) - does not stay closed or 28 VDC to radar and IR jammer controls is not present at P1-49.	9-22-1
5. **MISSION EL DC** circuit breaker (CB93) - does not stay closed or 28 VDC to external stores elevation panel is not present at P1-29.	9-22-1
6. **MISSION JETT** circuit breaker (CB89) - does not stay closed or 28 VDC to **STORES JETT** panel is not present at P1-18.	9-22-1
7. **NAV VDU** circuit breaker (CB91) - does not stay closed or 28 VDC to video display unit is not present at P1-41, -42	9-22-1
8. **FUEL TRANS** circuit breaker (CB56) - does not stay closed or 28 VDC to pilot **FUEL** panel is not present at P2-D.	9-22-1
9. **FUEL BST** circuit breaker (CB57) - does not stay closed or 28 VDC to fuel pressure switch is not present at P1-31, -48.	9-22-1
10. **TWHL LOCK** circuit breaker (CB59) - does not stay closed or 28 VDC to **TAIL WHEEL** lock panel is not present at P1-15.	9-22-1
11. **LT NAV** circuit breaker (CB73) - does not stay closed or 28 VDC to navigation lights is not present at P1-25.	9-22-1
12. **VIB MON** circuit breaker (CB79) - does not stay closed or 28 VDC to rotor balance signal processor is not present at P1-10.	9-22-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
V. Circuit Protection System (DC Essential Bus 3-Pilot Station) - Operational Check:	
1. A short exists between ground and A76P4-L or -K.	9-23-1
2. **MISSION PNVS DC** circuit breaker (CB61) - does not stay closed or 28 VDC to PNVS electronic unit is not present at P2-k.	9-23-1
3. **NAV HARS DC** circuit breaker (CB54) - does not stay closed or 28 VDC to HARS is not present at P1-46.	9-23-1
4. **NAV DPLR** circuit breaker (CB82) - does not stay closed or 28 VDC to doppler signal data comparator is not present at P1-51.	9-23-1
5. **NAV AIR DATA DC** circuit breaker (CB69) - does not stay closed or 28 VDC to air data processor is not present at P2-J.	9-23-1
6. **MISSION FC DC** circuit breaker (CB50) - does not stay closed or 28 VDC to pilot **FIRE CONTROL** panel is not present at P1-17.	9-23-1
7. **MISSION RKT ELEX** circuit breaker (CB47) - does not stay closed or 28 VDC to CPG **FIRE CONTROL** panel is not present at P1-27.	9-23-1
8. **ASE DC** circuit breaker (CB28) - does not stay closed or 28 VDC to ASE panel is not present at P1-34.	9-23-1
9. **ECS ICE DET** circuit breaker (CB68) - does not stay closed or 28 VDC to ice detector signal processor is not present at P1-47.	9-23-1
10. **ECS BLADE DEICE CONTR** circuit breaker (CB83) - does not stay closed or 28 VDC to rotor blade deice controller is not present at P1-14.	9-23-1
11. **ECS BLADE DEICE** circuit breaker (CB85) - does not stay closed or 28 VDC to blade deice contactor is not present at P1-53.	9-23-1
12. **STAB AUTO DC** circuit breaker (CB3) - does not stay closed or 28 VDC to stabilator control unit is not present at P2-f.	
W. Circuit Protection System (DC Essential Bus 3-CPG Station) - Operational Check:	
1. 28 VDC - is not present at P769-A, -J.	9-24-1

Symptom	Go to Para
2. **FC FCC DC** circuit breaker (CB4) - does not stay closed or continuity to fire control computer does not exist between J4-J and J2-32.	9-24-1
3. **AWS AWS DC** circuit breaker (CB12) - does not stay closed or continuity to gun and turret control boxes does not exist between J4-J and J2-24, -33.	9-24-1
4. **MSL DC ELEC** circuit breaker (CB17) - does not stay closed or continuity to remote hellfire electronics unit does not exist between J4-J and J2-20, -21.	9-24-1
5. **MUX CPG** circuit breaker (CB15) - does not stay closed or continuity to CPG MRTU type III does not exist between J4-A and J2-7.	9-24-1
6. **MUX L PYL OUTBD** circuit breaker (CB2) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-11.	9-24-1
7. **MUX L PYL INBD** circuit breaker (CB1) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-9.	9-24-1
8. **MUX R PYL INBD** circuit breaker (CB5) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-8.	9-24-1
9. **MUX R PYL OUTBD** circuit breaker (CB6) - does not stay closed or continuity to pylon MRTU type II does not exist between J4-A and J2-10.	9-24-1
10. **MUX FAB L** circuit breaker (CB10) - does not stay closed or continuity to left FAB MRTU type I does not exist between J4-A and J2-14.	9-24-1
11. **MUX FAB R** circuit breaker (CB9) - does not stay closed or continuity to right FAB MRTU type I does not exist between J4-A and J2-13.	9-24-1
12. **CDU** circuit breaker (CB6) - does not stay closed.	9-24-1

X. Circuit Protection System (DC Emergency Bus-Pilot Station) - Operational Check:

Symptom	Go to Para
1. Short exists between ground and A76P5-1, -2, -3.	9-25-1
2. Continuity - does not exist between A76P5-2 and A76P5-1, -3.	9-25-1
3. **LT SRCH/LDG** circuit breaker (CB22) - does not stay closed or continuity to search light relay does not exist between A76P5-2 and -4.	9-25-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
X. Circuit Protection System (DC Emergency Bus - Pilot Station) - Operational Check (cont):	
4. **APU HOLD** circuit breaker (CB10) - does not stay closed or continuity to **BTL DISCHARGE/ APU** panel does not exist between A76J1-h and -B.	9-25-1
5. **FUEL FILL** circuit breaker (CB32) - does not stay closed or continuity to refuel panel does not exist between A76J1-h and -A,	9-25-1
6. **JETT** circuit breaker (CB34) - does not stay closed or 28 VDC to pilot and CPG collective stick **ST JETT** switch is not present at A76J1-P, -R.	9-25-1
7. **ENG WARN** circuit breaker (CB52) - does not stay closed or 28 VDC to engine out warning unit is not present at A76J1-N.	9-25-1
8. **FUEL APU** circuit breaker (CB9) - does not stay closed or 28 VDC to ground service utility receptacle is not present at A76J1-z.	9-25-1
9. **FUEL VLV ACTR** circuit breaker (CB14) - does not stay closed or 28 VDC to pilot fire extinguish panel is not present at A76J1-C.	9-25-1
10. **FIRE EXTGH APU** circuit breaker (CB26) - does not stay closed or 28 VDC to **BTL DISCHARGE/APU** panel is not present at A76J1-J.	9-25-1
11. **FIRE EXTGH CPG** circuit breaker (CB15) - does not stay closed or 28 VDC to CPG fire extinguish panel is not present at A76J1-H.	9-25-1
12. **FIRE EXTGH PLT** circuit breaker (CB25) - does not stay closed or 28 VDC to pilot fire extinguish panel is not present at A76J1-D.	9-25-1
13. **FIRE DETR APU** circuit breaker (CB11) - does not stay closed or 28 VDC to APU flame detector is not present at A76J1-E.	9-25-1
14. **FIRE DETR ENG 2** circuit breaker (CB13) - does not stay closed or 28 VDC to engine 2 flame detector is not present at A76J1-G.	9-25-1
15. **FIRE DETR ENG 1** circuit breaker (CB12) - does not stay closed or 28 VDC to engine 1 flame detector is not present at A76J1-F.	9-25-1
16. **ENG INST** circuit breaker (CB17) - does not stay closed or 28 VDC to signal data converter is not present at A76J1-L, -M.	9-25-1
17. **ENG START** circuit breaker (CB58) - does not stay closed or 28 VDC to pilot power quadrant is not present at A76J1-c, -X.	9-25-1

Symptom	Go to Para
18. **ENG LVR** circuit breaker (CB16) - does not stay closed or 28 VDC to pilot fire extinguish panel is not present at A76J1-K.	9-25-1
19. **ENG CUT** circuit breaker (CB60) - does not stay closed or 28 VDC to pilot and CPG collective sticks is not present at A76J1-b.	9-25-1
20. **THROT** circuit breaker (CB8) - does not stay closed or 28 VDC to CPG power quadrant panel is not present at A76J1-d.	9-25-1
21. **STBY ATTD** circuit breaker (CB19) - does not stay closed or 28 VDC to standby attitude indicator is not present at A76J1-e.	9-25-1
22. **RDR ALT** circuit breaker (CB31) - does not stay closed or 28 VDC to radar altimeter receiver and transmitter is not present at A76J1-f, -g.	9-25-1
23. **TRIM** circuit breaker (CB87) - does not stay closed or 28 VDC to pilot and CPG cyclic sticks is not present at A76J1-Y, -Z.	9-25-1
24. **EMERG HYD** circuit breaker (CB35) - does not stay closed or 28 VDC to primary and utility hydraulic manifolds is not present at A76J1-k, -m.	9-25-1
25. **LT UTIL SEC** circuit breaker (CB23) - does not stay closed or 28 VDC to utility lights is not present at A76J1-U, -W.	9-25-1
26. **LT SRCH/LDG CONT** circuit breaker (CB80) - does not stay closed or 28 VDC to pilot and CPG collective sticks - search light control is not present at A76J1-V.	9-25-1
27. **LT CAUT** circuit breaker (CB21) - does not stay closed or 28 VDC to pilot master and caution/warning panels is not present at A76J1-y.	9-25-1
28. **CHAFF** circuit breaker (CB48) - does not stay closed or 28 VDC to chaff dispense control is not present at A76J1-t.	9-25-1
29. **RTR BRK** circuit breaker (CB37) - does not stay closed or 28 VDC to rotor brake pressure switch is not present at A76J1-n.	9-25-1
30. **RDR WARN** circuit breaker (CB53) - does not stay closed or 28 VDC to radar warning detecting set control is not present at A76J1-q.	9-25-1
31. **PITOT HTR** circuit breaker (CB36) - does not stay closed or 28 VDC to pilot **ANTI-ICE** panel is not present at A76J1-s.	9-25-1
32. **COMM ICS** circuit breaker (CB27) - does not stay closed or 28 VDC to audio junction unit is not present at A76J1-a.	9-25-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
X. Circuit Protection System (DC Emergency Bus - Pilot Station) - Operational Check (cont):	
33. **COMM VHF FM** circuit breaker (CB64) - does not stay closed or 28 VDC to phase front homing module is not present at A76J1-w.	9-25-1
34. **COMM KY 28** circuit breaker (CB30) - does not stay closed or 28 VDC to secure voice control panel is not present at A76J1-p.	9-25-1
35. **COMM UHF AM** circuit breaker (CB24) - does not stay closed or 28 VDC to UHF - AM radio control panel is not present at A76J1-v.	9-25-1
36. **COMM IFF** circuit breaker (CB29) - does not stay closed or 28 VDC to IFF receiver transmitter is not present at A76J1-S.	9-25-1
37. **COMM ADF** circuit breaker (CB65) - does not stay closed or 28 VDC to direction finder receiver is not present at A76J1-r.	9-25-1
38. **ECS CAB** circuit breaker (CB76) - does not stay closed or 28 VDC to **AUX** panel is not present at A76P1-2.	9-25-1
39. **FUEL XFEED** circuit breaker (CB55) - does not stay closed or 28 VDC to engine 1 and 2 fuel valve actuators is not present at P1-32.	9-25-1
Y. Circuit Protection System (DC Emergency Bus - CPG Station) - Operational Check:	
1. **EMERG BATT ICS** circuit breaker (CB13) - does not stay closed or continuity to audio junction unit does not exist between J4-C and J1-5.	9-26-1
2. Continuity - does not exist between A77J4-C and CB29-1 or 28 VDC is not present at P769-C.	9-26-1
3. **EMERG BATT VHF AM/FM** circuit breaker (CB32) - does not stay closed or continuity to radio control panel does not exist between J4-C and J1-7.	9-26-1
4. **EMERG BATT ENG INST** circuit breaker (CB31) - does not stay closed or continuity to signal data converter does not exist between J4-C and J1-8, -10.	9-26-1
5. **EMERG BATT UTIL SEC LT** circuit breaker (CB30) - does not stay closed or continuity to CPG interior light panels does not exist between J4-C and J1-2, -3.	9-26-1

9-1-1

Symptom	Go to Para
6. **EMERG BATT CAUT** circuit breaker (CB29) - does not stay closed or continuity to master and caution/warning panels does not exist between J4-C and J1-4.	9-26-1
Z. Circuit Protection System (DC Ground Circuit Breakers-Pilot Station) - Operational Check:	
1. Open exists between A76P1-50 and -16 or a short exists between ground and A76P1-16.	9-27-1
2. Open exists between A76P1-1 and -8 or a short exists between ground and A76P1-1.	9-27-1
3. Open exists between A402J1-8 and -16.	9-27-1
AA. Circuit Protection System (DC Ground Circuit Breakers - CPG Station) - Operational Check:	
1. Short exists - between ground and A77J2-39.	9-28-1
2. Continuity between A77J2-39 and -6 - does not exist or a short to launcher seeker No. 2 exists between ground and A77J2-6.	9-28-1
3. Continuity between A77J2-39 and -17 - does not exist or a short to launcher seeker No. 1 exists between ground and A77J2-17.	9-28-1
4. Continuity between A77J2-39 and -23 - does not exist or a short to ejector RCCB exists between ground and A77J2-23.	9-28-1
5. Continuity between A77J2-39 and -25 - does not exist or short to launcher seeker No. 3 exists between ground and A77J2-25.	9-28-1
6. Continuity between A77J2-39 and -18 - does not exist or short to launcher seeker No. 4 exists between ground and A77J2-18.	9-28-1
7. Continuity between ground and P767-39 - does not exist.	9-28-1
AB. Circuit breaker Edge-Light Panel - Operational Check:	
1. Pilot circuit breaker edge-light panels - do not function.	9-29-1
2. CPG circuit breaker panel No. 1 edge-light - does not light.	9-29-1
3. CPG circuit breaker panel No. 2 edge-light - does not light.	9-29-1
AC. Pilot and CPG Caution/Warning Panels - Indicators Functional Data.	9-30-1
AD. Pilot Caution and Warning System - Operational Check:	
1. **LT CAUT** circuit breaker (CB21) - does not stay closed.	9-31-1
2. **PRESS TO TEST** indicator - is not lighted.	9-31-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
AD. Pilot Caution and Warning System - Operational Check (cont):	
3. Master caution/warning and caution/warning panels - are not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
4. **MASTER CAUTION** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
5. **LOW RPM ROTOR** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
6. **FIRE APU** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
7. **ENGINE 1 OUT** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
8. **ENGINE CHOP** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
9. **ENGINE 2 OUT** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
10. **HIGH RPM ROTOR** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
11. **BUCS FAIL** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
12. **PRI DISCH** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
13. **RES DISCH** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
14. **ENG 1** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
15. **ENG 2** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
16. **BLADE ON** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
17. **ENG 1** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
18. **ENG 2** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
19. **EMERG PWR** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
20. **ROCKETS** panel indicators - are not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
21. **TAIL WHEEL** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
22. **ARM/SAFE** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
23. **FIRE PULL ENG 1** switch - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
24. **FIRE PULL ENG 2** switch - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
25. **MA** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1

Symptom	Go to Para
26. Radar warning control panel **SELF TEST** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
27. Remote transmit select indicator(s) - are not lighted with **PRESS TO TEST** indicator depressed.	9-31-1
28. **MASTER CAUTION** indicator - does not reset caution indicators.	9-31-1
29. **APU FIRE PULL HANDLE** - does not light with **PRESS TO TEST** indicator depressed.	9-31-1

AE. CPG Caution and Warning System - Operational Check:

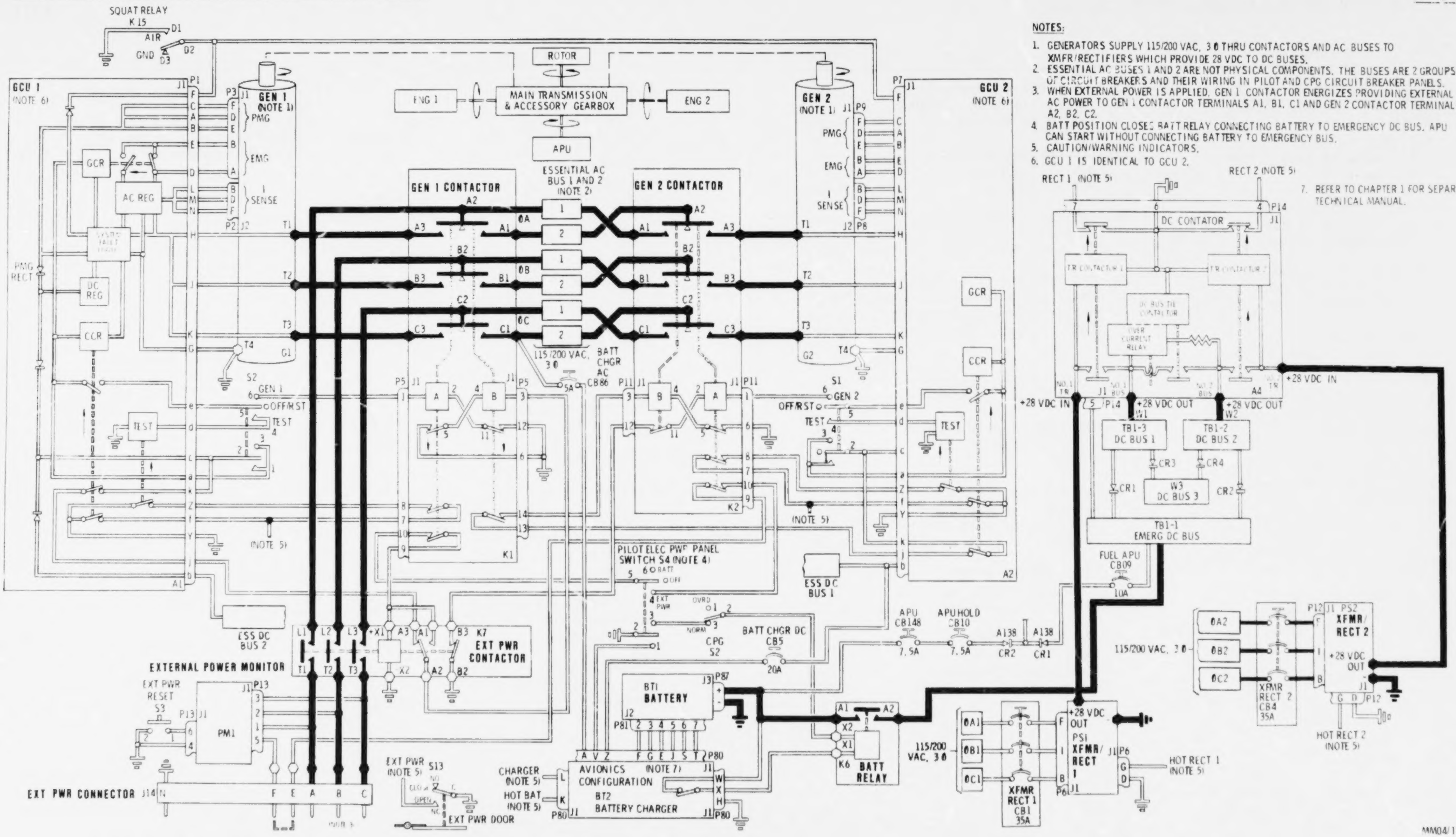
Symptom	Go to Para
1. **EMERG BATT CAUT** circuit breaker (CB29) - does not stay closed.	9-32-1
2. **PRESS TO TEST** indicator - is not lighted.	9-32-1
3. All caution/warning master caution and indicators - do not light with **PRESS TO TEST** indicator depressed.	9-32-1
4. **MASTER CAUTION** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
5. **LOW RPM ROTOR** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
6. **FIRE APU** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
7. **ENGINE 1 OUT** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
8. **ENGINE CHOP** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
9. **ENGINE 2 OUT** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
10. **HIGH RPM ROTOR** - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
11. **BUCS FAIL** indicator - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
12. **ARM/SAFE** advisory light - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
13. **FIRE PULL ENG 1** switch - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
14. **FIRE PULL ENG 2** switch - is not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
15. Pilot and CPG **ADS** indicators - are not lighted with CPG FCC **MUX ON**.	9-32-1
16. CPG **TADS** indicator - is not lighted with **TADS** switch in **TADS** position.	9-32-1

9-1-1. ELECTRICAL SYSTEM - FAILURE SYMPTOM LIST (cont)

Symptom	Go to Para
AE. CPG Caution and Warning System - Operational Check (cont):	
17. Pilot **TADS** indicator - is not lighted with **TADS** switch in **TADS** position.	9-32-1
18. CPG **ROCKET** indicator - is not lighted with **RKT** switch in **NORM** position.	9-32-1
19. Pilot **ROCKET** indicator - is not lighted with **RKT** switch in **NORM** position.	9-32-1
20. CPG **GUN** indicator - is not lighted with **GUN** switch in **NORM** position.	9-32-1
21. Pilot **GUN** indicator - is not lighted with **GUN** switch in **NORM** position.	9-32-1
22. CPG **MISSILE** indicator - is not lighted with **MSL** switch in **ON** position.	9-32-1
23. Pilot **MISSILE** indicator - is not lighted with **MSL** switch in **ON** position.	9-32-1
24. CPG PRI **MUX** indicator - is not lighted with **MUX** switch in **SEC** position.	9-32-1
25. CPG **MASTER CAUTION** reset - does not function.	9-32-1
26. Pilot **PRI MUX** indicator - is not lighted with **MUX** switch in **SEC** position.	9-32-1
27. CPG caution/warning edge-light panel - is not lighted.	9-32-1
28. CPG caution/warning indicators - do not increase in brightness.	9-32-1
29. CPG **ARM/SAFE, FIRE PULL ENG** 1 and 2 indicators - are not lighted with **PRESS TO TEST** indicator depressed.	9-32-1
AF. Audio Warning System - Operational Check:	
1. **ENG WARN** circuit breaker (CB52) - does not stay closed.	9-33-1
2. Low RPM rotor audio warning - is not heard in either pilot or CPG headset.	9-33-1
3. Pilot **ENGINE 1 OUT** indicator - does not reset audio warning.	9-33-1
4. CPG **ENGINE 1 OUT** indicator - is not lighted with engine 1 not running.	9-33-1

Symptom	Go to Para
5. Pilot **ENGINE 1 OUT** indicator - is not lighted with engine 1 not running.	9-33-1
6. CPG **ENGINE 1 OUT** indicator - does not reset audio warning.	9-33-1
7. Pilot **ENGINE 2 OUT** indicator - is not lighted with engine 2 not running.	9-33-1
8. Pilot **ENGINE 2 OUT** indicator - does not reset audio warning.	9-33-1
9. CPG **ENGINE 2 OUT** indicator - is not lighted with engine 2 not running.	9-33-1
10. CPG **ENGINE 2 OUT** indicator - does not reset audio warning.	9-33-1
11. Stabilator audio warning - is not heard in either pilot or CPG headset.	9-33-1
12. Pilot **RESET** button - does not reset stabilator audio warning.	9-33-1
13. CPG **RESET** button - does not reset stabilator audio warning.	9-33-1
14. False engine out warning occurs inflight (single engine maneuver at high power setting and Np less than 89 percent).	9-33-1

9-1-2. ELECTRICAL POWER GENERATION - SYSTEM DIAGRAM



NOTES:

1. GENERATORS SUPPLY 115/200 VAC, 3 0 THRU CONTACTORS AND AC BUSES TO XMFR/RECTIFIERS WHICH PROVIDE 28 VDC TO DC BUSES.
2. ESSENTIAL AC BUSES 1 AND 2 ARE NOT PHYSICAL COMPONENTS. THE BUSES ARE 2 GROUPS OF CIRCUIT BREAKERS AND THEIR WIRING IN PILOT AND CPG CIRCUIT BREAKER PANELS.
3. WHEN EXTERNAL POWER IS APPLIED, GEN 1 CONTACTOR ENERGIZES PROVIDING EXTERNAL AC POWER TO GEN 1 CONTACTOR TERMINALS A1, B1, C1 AND GEN 2 CONTACTOR TERMINALS A2, B2, C2.
4. BATT POSITION CLOSES BATT RELAY CONNECTING BATTERY TO EMERGENCY DC BUS. APU CAN START WITHOUT CONNECTING BATTERY TO EMERGENCY BUS.
5. CAUTION/WARNING INDICATORS.
6. GCU 1 IS IDENTICAL TO GCU 2.
7. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

9-2-1. AC ELECTRICAL POWER GENERATION - FD/LS CHECK

Personnel Required:

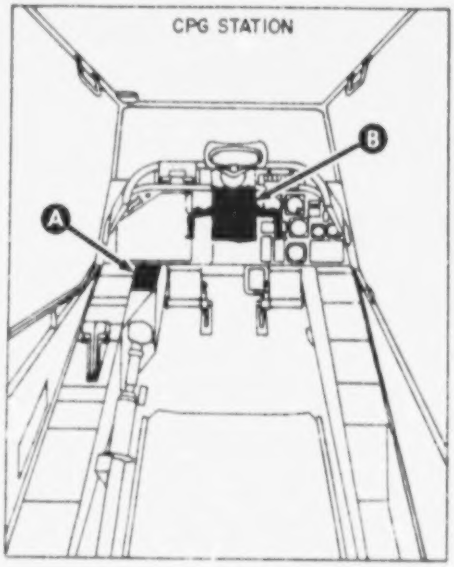
68J10 Aircraft Fire Control Repairer or
67R20 Attack Helicopter Repairer

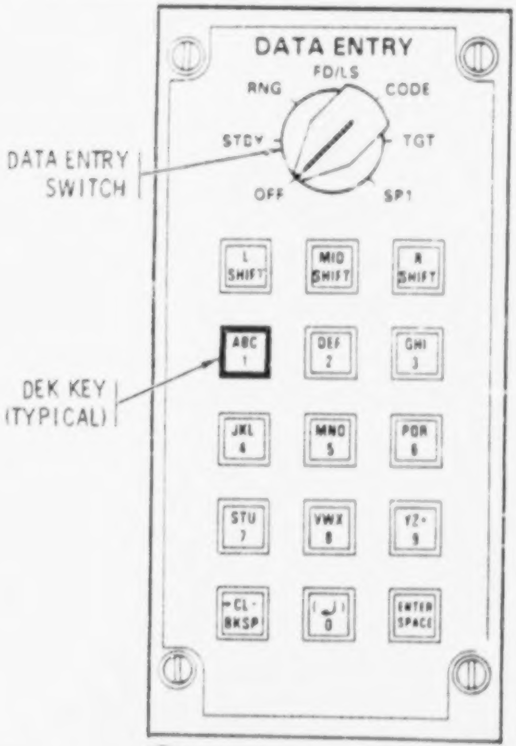
References:

TM 55-1520-238-23

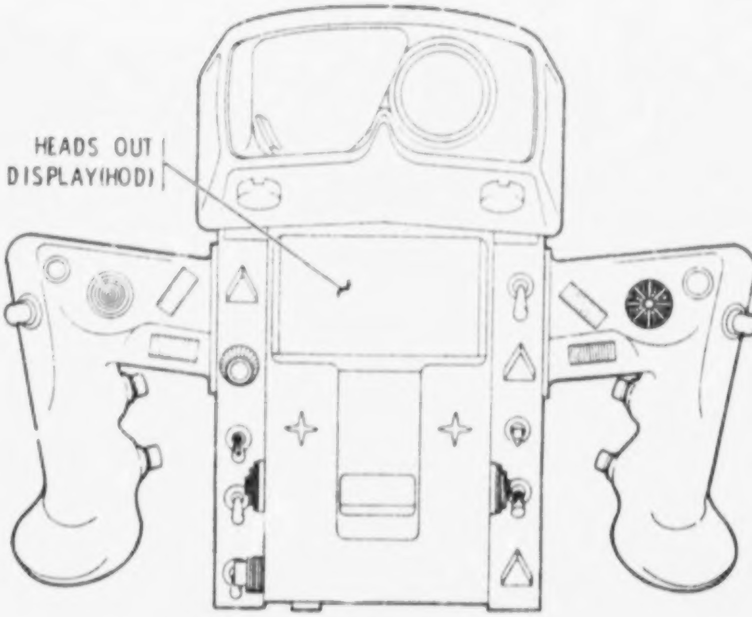
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-2-3	AC ELECTRICAL POWER GENERATION - POWER UP completed
Chapter 1	FD/LS OPERATION - STARTING completed





A DATA ENTRY KEYBOARD (DEK)



B OPTICAL RELAY TUBE (ORT)

MM04/1-804A

NOTE

- Control/switch position changes prompted by FD/LS must be performed within 30 seconds of prompt message, or false **NO-GO** message will appear.
- If FD/LS message on HOD does not change within 2 seconds after prompted control/switch position change (acknowledge) discontinue FD/LS test and go to para 9-2-2.

A. Perform FD/LS check as follows:

TASK	RESULT
1. On data entry keyboard (DEK) verify **DATA ENTRY** switch is set to FD/LS.	
2. Depress any DEK key except **ENTER SPACE** or **SHIFT**.	If FD/LS menu does not appear on HOD, refer to TM 9-1230-476-20-2 to troubleshoot the multiplex subsystem.
3. Depress DEK keys **0** (zero) and **8**.	If **MUX COMMUNICATION GO** appears on HOD, go to next step. If any **MUX NO-GO** appears on HOD, refer to TM 9-1230-476-20-2 to troubleshoot multiplex system.

GO TO NEXT PAG

9-2-1. AC ELECTRICAL POWER GENERATION - FD/LS CHECK (cont)

TASK	RESULT
4. Depress any key except **ENTER** **SPACE** or **SHIFT** key, then depress keys 1 and **8**.	If **GENERATOR SYSTEMS GO** appears on HOD, go to next step. If one or more FD/LS NO-GO DISPLAYS listed below appear on the HOD, perform the following in sequence: (a) Perform AC ELECTRICAL POWER GENERATION POWER DOWN (para 9-2-4). (b) Perform CORRECTIVE ACTION indicated for first NO-GO displayed on HOD. (c) Perform AC ELECTRICAL POWER GENERATION POWER UP (para 9-2-3). (d) On DEK, momentarily set **DATA ENTRY** switch to **STBY**, then back to **FD/LS**. (e) Depress any DEK key except **ENTER** **SPACE** and **SHIFT** keys. (f) Repeat step 4 until no NO-GOs are displayed. If NO-GO repeats after **CORRECTIVE ACTION**, go to para 9-2-2.
5. When **PUT GEN 1 SWITCH IN TEST POSITION** appears on Head Out Display (HOD), set **GEN 1** switch ELEC PWR panel to **TEST** position.	
6. When **PUT GEN 2 SWITCH IN TEST POSITION** appears on HOD, release GEN 1 switch and set **GEN 2** switch to TEST position.	
7. When a **GO** or a **NO-GO** display appears on HOD, release **GEN 2** switch to the **OFF/RESET** position.	
8. Set **DATA ENTRY** switch to **OFF**.	

B. Perform FD/LS OPERATION - STOPPING (Chapter 1).

C. If Operational Check is to be performed, go to para 9-2-2.

D. Perform AC ELECTRICAL POWER GENERATION - POWER DOWN (para 9-2-4).

FD/LS NO-GO DISPLAY	CORRECTIVE ACTION	FD/LS NO-GO DISPLAY	CORRECTIVE ACTION
GENERATOR 1 NO-GO LH XMSN BAY	Replace generator 1 (TM 55-1520-238-23)	**GENERATOR 1 CONTROL NO-GO POWER CENTER**	Replace generator 1 control (TM 55-1520-238-23)
GENERATOR 2 NO-GO RH XMSN BAY	Replace generator 2 (TM 55-1520-238-23)	**GENERATOR 2 CONTROL NO-GO POWER CENTER**	Replace generator 2 control (TM 55-1520-238-23)

END OF TASK

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

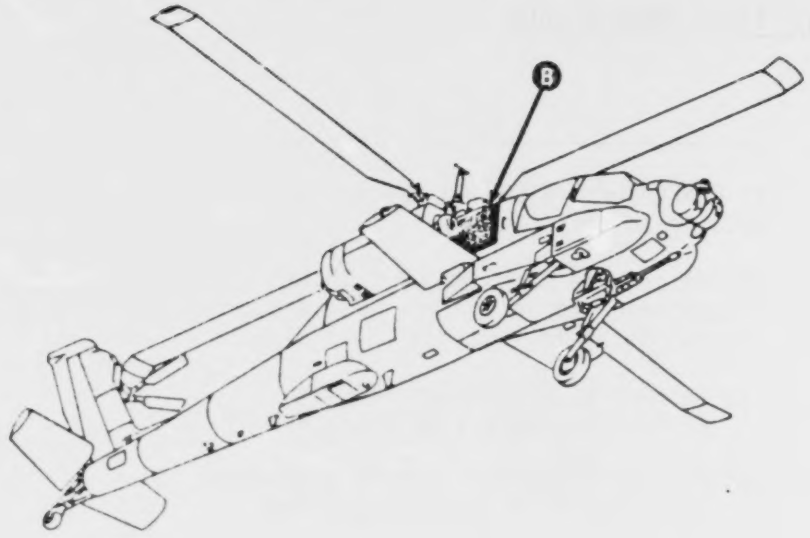
67R20 Attack Helicopter Repairer
68F10 Aircraft Electrician

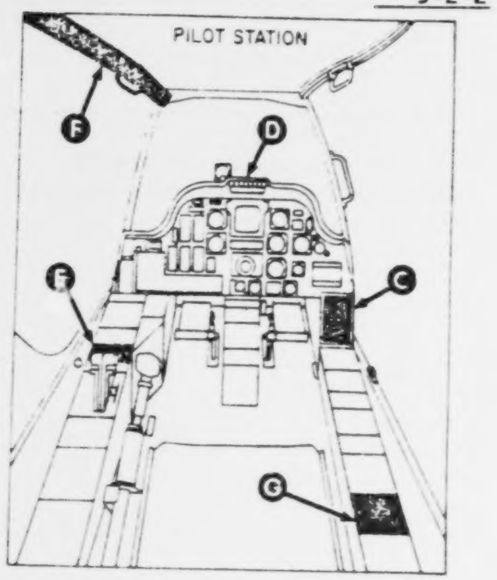
References:

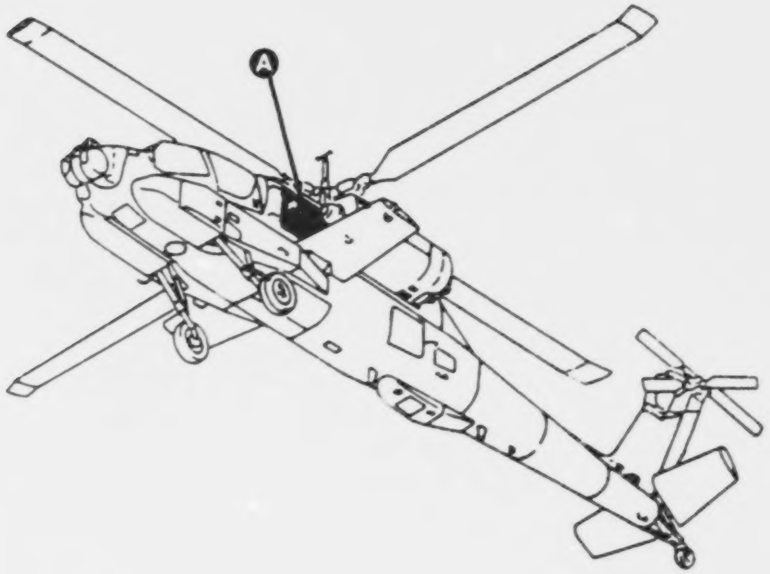
TM 55-1520-238-23

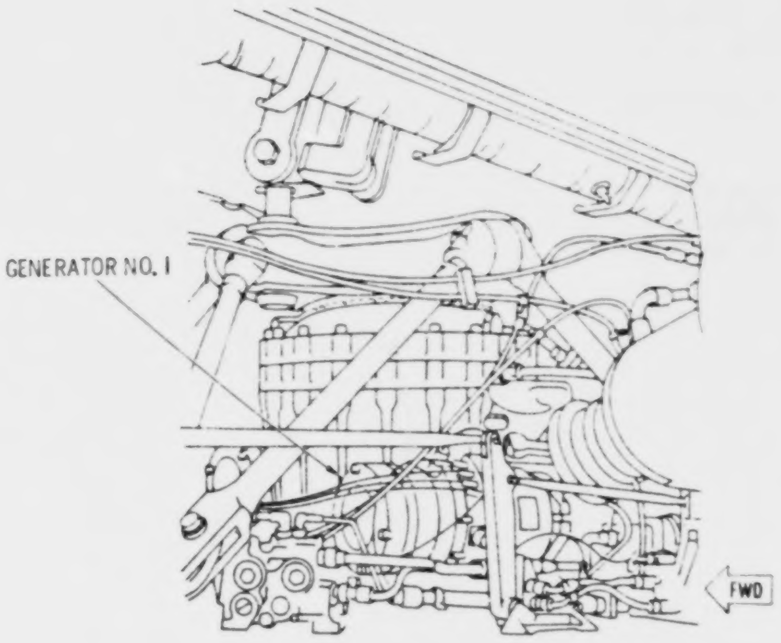
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Power generation and distribution - inspection performed
Para 9-2-3	AC ELECTRICAL POWER GENERATION - POWER UP completed

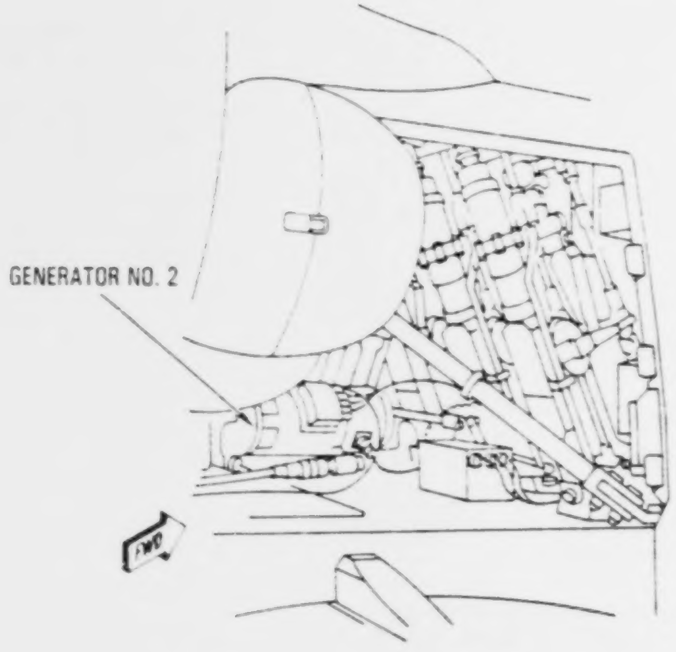








Ⓐ MAIN DECK THROUGH ACCESS PANEL L200



Ⓑ MAIN DECK THROUGH ACCESS PANEL R200

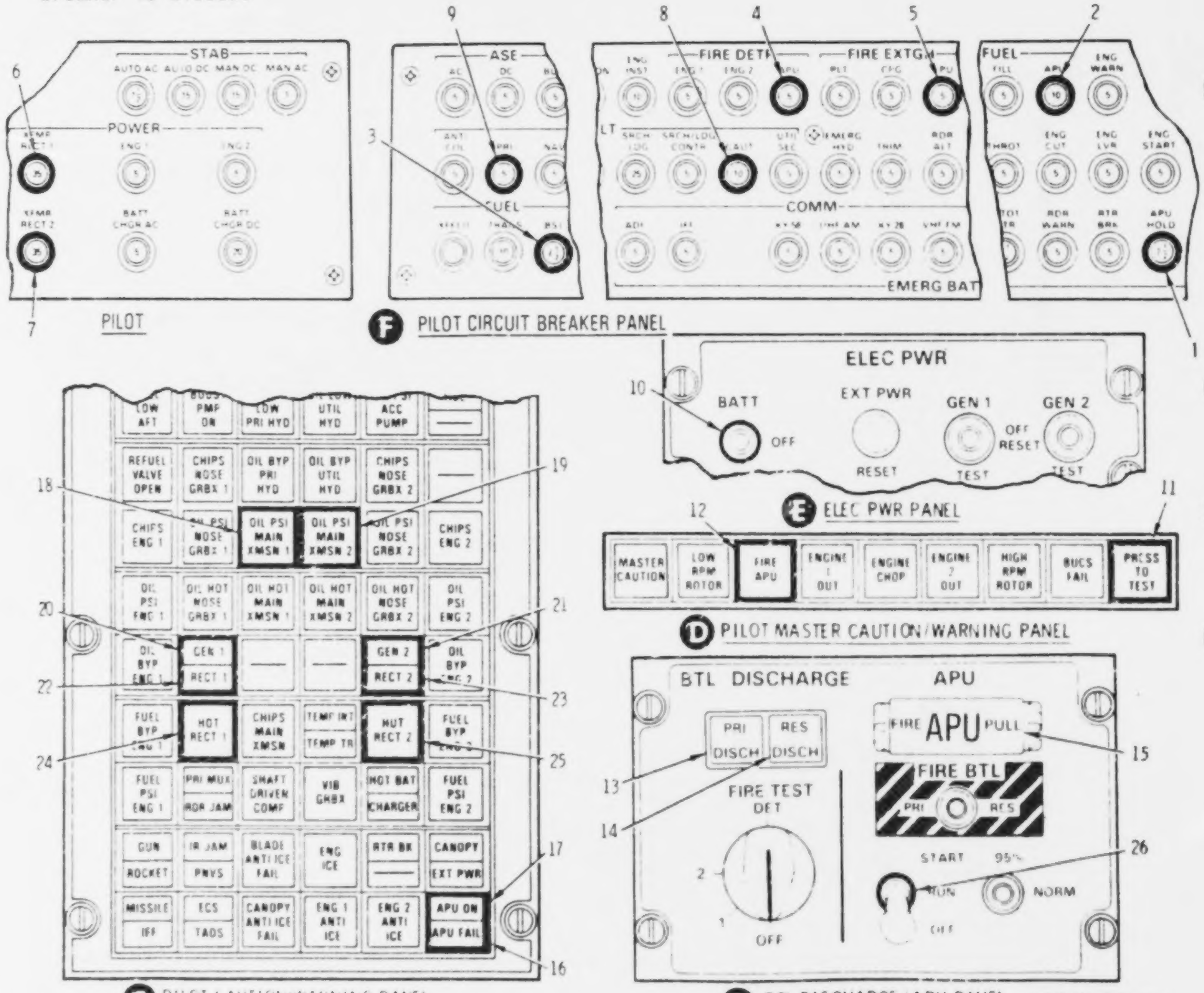
MM04/1-789-1B

GO TO NEXT PAGE

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On ELEC PWR panel, set BATT/EXT PWR switch (10) to BATT.	
2. On pilot circuit breaker panel, check that LT CAUT (8) circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-31-4.
3. On pilot master caution/warning panel, depress **PRESS TO TEST** indicator (11).	
4. On pilot master caution/warning panel, check that **FIRE APU** (12) indicator is lighted. On **BTL DISCHARGE/APU PANEL**, check that **PRI DISCH** (13), **RES DISCH** (14), and **FIRE APU PULL** (15) indicators are lighted.	If indicator(s) are not lighted, go to para 9-31-1.
5. On pilot caution/warning panel, check that **APU FAIL** (16), **APU ON** (17), **OIL PSI MAIN XMSN 1** (18), **OIL PSI MAIN XMSN 2** (19), **GEN 1** (20), **GEN 2** (21), **RECT 1** (22), **RECT 2** (23), **HOT RECT 1** (24), and **HOT RECT 2** (25) indicators are lighted.	If **GEN 1** (20) indicator is not lighted, go to para 9-2-10. If **GEN 2** (21) indicator is not lighted, go to para 9-2-7. If **APU FAIL** (16), **APU ON** (17), **OIL PSI MAIN XMSN 1** (18), **OIL PSI MAIN XMSN 2** (19), **RECT 1** (22), **RECT 2** (23), **HOT RECT 1** (24), or **HOT RECT 2** (25) indicator(s) are not lighted, go to para 9-30-1.
6. On pilot center circuit breaker panel, check that **APU HOLD** (1), **FUEL APU** (2), and **FUEL BST** (3) circuit breakers are closed.	If circuit breaker(s) do not stay closed, refer to chapter 15 to troubleshoot APU.
7. On pilot center circuit breaker panel, check that **FIRE DETR APU** (4), and **FIRE EXTGH APU** (5) circuit breakers are closed.	If circuit breaker(s) do not stay closed, refer to chapter 12 to troubleshoot APU fire detection and extinguishing.
8. On pilot aft circuit breaker panel, check that **POWER XFMR RECT 1** (6) and **POWER XFMR RECT 2** (7) circuit breakers are closed.	If **POWER XFMR RECT 1** (6) does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** (7) does not stay closed, go to para 9-3-7.



F PILOT CIRCUIT BREAKER PANEL

E ELEC PWR PANEL

D PILOT MASTER CAUTION/WARNING PANEL

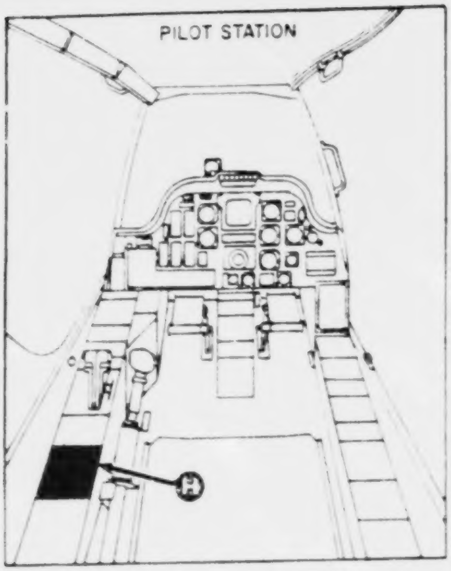
C PILOT CAUTION/WARNING PANEL

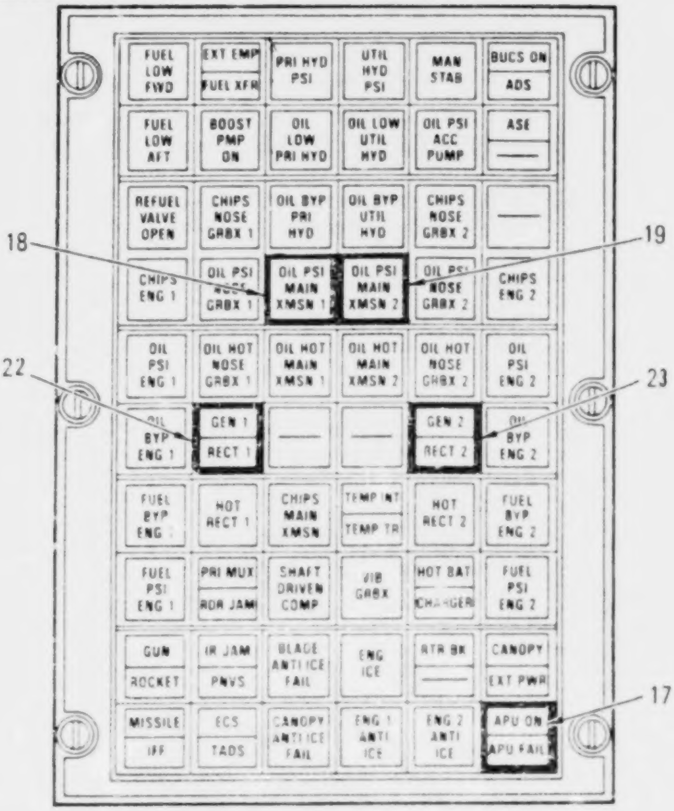
G BTL DISCHARGE/APU PANEL

AM04/1-789-2B

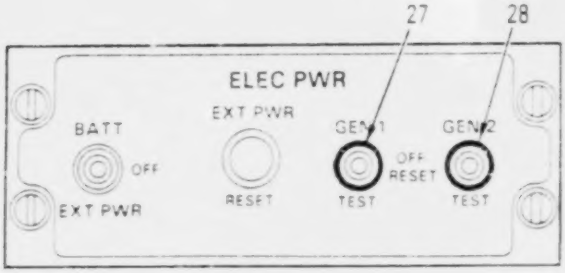
GO TO NEXT PAGE

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

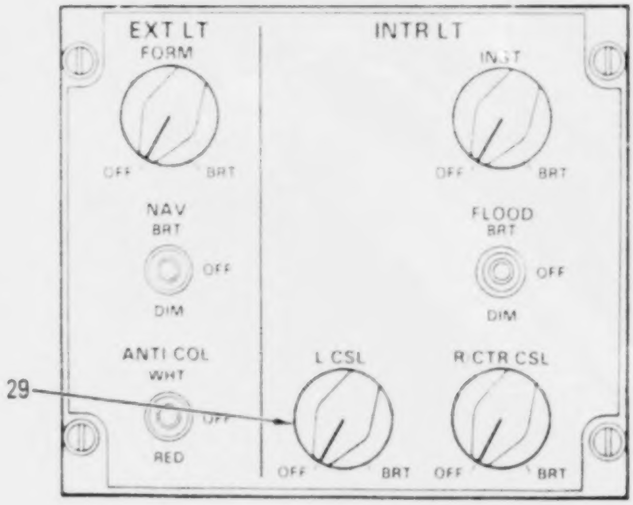


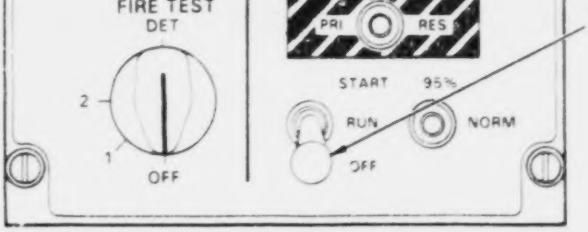


PILOT CAUTION/WARNING PANEL



ELEC PWR PANEL





BTL DISCHARGE/APU PANEL

H PILOT EXT LT/INTR LT PANEL

MM04/1-789-3B

TASK	RESULT
9. On pilot center circuit breaker panel, check that **LT PRI** (9) circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-13-4.
10. On pilot caution/warning panel, check that **APU ON** (17), **OIL PSI MAIN XMSN 1** (18), and **OIL PSI MAIN XMSN 2** (19) indicators are lighted.	If **APU ON** indicator (17) is not lighted, refer to chapter 15 to troubleshoot APU. If **APU ON** indicator (17) is lighted and **OIL PSI MAIN XMSN 1** (18) and **OIL PSI MAIN XMSN 2** (19) indicators are not lighted, refer to chapter 6 to troubleshoot main transmission.
11. On **ELEC PWR** panel, set **GEN 1** (27) switch to TEST.	
12. On pilot caution/warning panel, check that **GEN 1** (20) indicator is not lighted.	If **GEN 1** (20) indicator is lighted, go to para 9-2-8.
13. On **ELEC PWR** panel, set **GEN 2** (28) switch to TEST.	
14. On pilot caution/warning panel, check that **GEN 2** (21) indicator is not lighted.	If **GEN 2** (21) indicator is lighted, go to para 9-2-9.
15. Remove EXTERNAL POWER - ELECTRICAL (TM 55-1520-238-23).	
16. On **ELEC PWR** panel, set **GEN 1** (27) and **GEN 2** (28) switches to **GEN 1** and **GEN 2**.	If **GEN 1** (20) indicator is lighted, go to para 9-2-12. If **GEN 2** (21) indicator is lighted, go to para 9-2-13.
17. On **ELEC PWR** panel, set **GEN 1** switch (27) to **OFF** position. On pilot caution/warning panel, check that **RECT 1** indicator (22) is not lighted.	If **RECT 1** indicator (22) is lighted, go to para 9-2-14.
18. On **ELEC PWR** panel, set **GEN 1** switch (27) to **GEN 1** position, and **GEN 2** switch (28) to **OFF/RESET** position. On pilot caution/warning panel, check that **RECT 2** indicator (23) is not lighted.	If **RECT 2** indicator (23) is lighted, go to para 9-2-15.

GO TO NEXT PAGE

9-2-2. AC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

TASK	RESULT
19. On **ELEC PWR** panel, set **GEN 2** switch (28) to **GEN 2** position.	
20. On pilot **EXT LT/INTR LT** panel, turn L **CSL** control (29) to **BRT**.	If **ELEC PWR** panel edge-lighting does not come on, go to para 9-2-11.

B. On pilot **EXT LT/INTR LT** panel, turn L **CSL** (29) to **OFF**.

C. On **ELEC PWR** panel, set **GEN 1** (27) and **GEN 2** (28) switches to **OFF/RESET**.

D. On BTL **DISCHARGE/APU** panel, set **START** switch (26) to **OFF**.

END OF TASK

9-2-3. AC ELECTRICAL POWER GENERATION - POWER UP

Personnel Required:

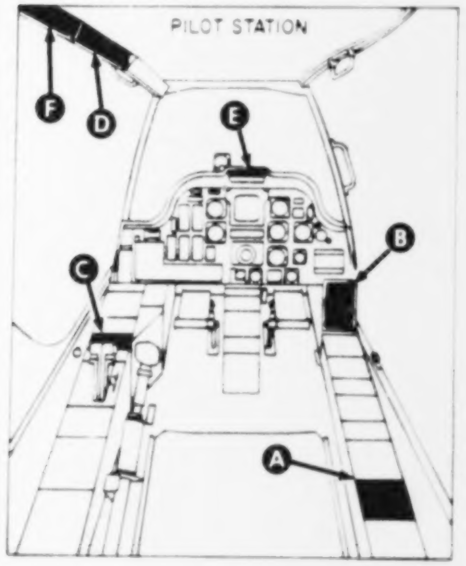
67R20 Attack Helicopter Repairer

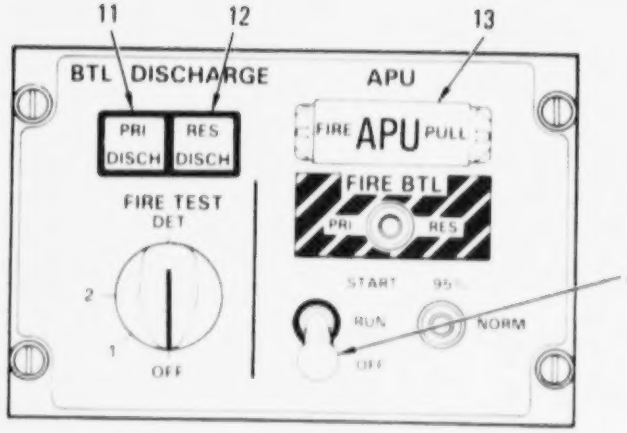
References:

TM 55-1520-238-23

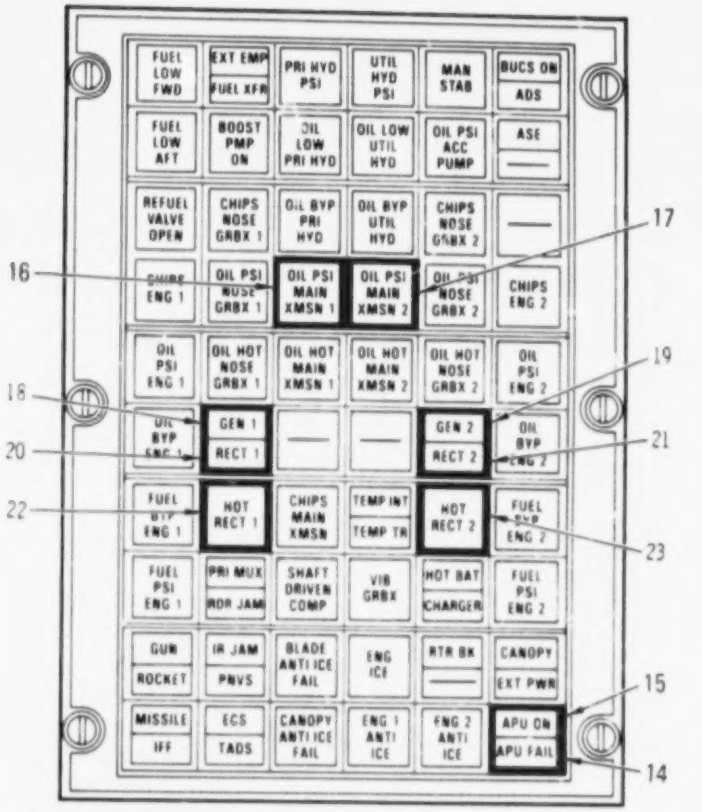
Equipment Conditions:

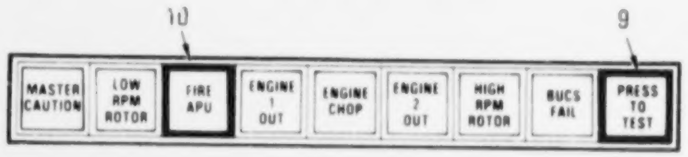
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

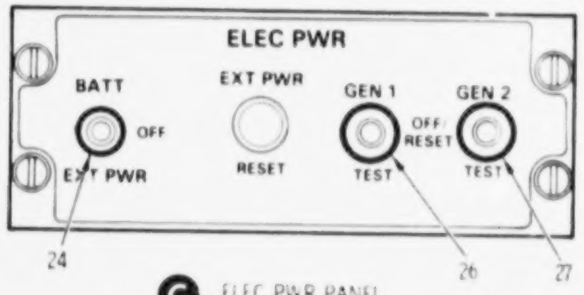




Ⓐ BTL DISCHARGE / APU PANEL



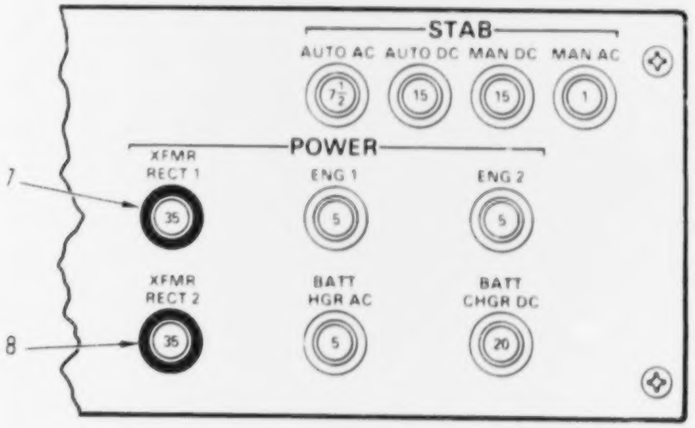




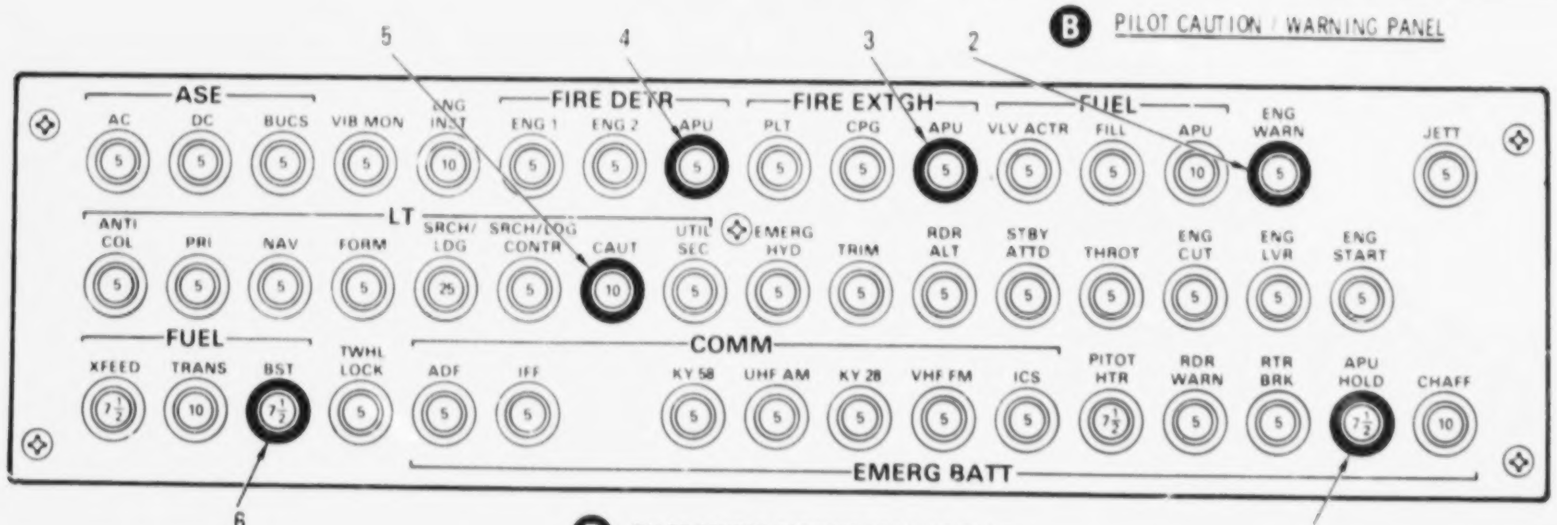
Ⓒ ELEC PWR PANEL

Ⓑ PILOT CAUTION / WARNING PANEL

Ⓔ PILOT MASTER CAUTION / WARNING PANEL



Ⓕ PILOT AFT CIRCUIT BREAKER PANEL



Ⓓ PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-779B

GO TO NEXT PAGE

9-2-3. AC ELECTRICAL POWER GENERATION - POWER UP (cont)

A. Complete the power up procedure as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that the following circuit breakers are closed:	If circuit breaker(s) do not stay closed, go to para 9-2-2.

Item No.	Pilot Circuit Breaker Panel	Name
1	Center Panel	**APU HOLD**
2	Center Panel	**FUEL APU**
3	Center Panel	**FIRE EXTGH APU**
4	Center Panel	**FIRE DETR APU**
5	Center Panel	**LT CAUT**
6	Center Panel	**FUEL BST**
7	Aft Panel	**POWER XFMR RECT 1**
8	Aft Panel	**POWER XFMR RECT 2**

TASK	RESULT
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (24) to **BATT**.	
3. On pilot master caution/warning panel, depress **PRESS TO TEST** indicator (9).	
4. On pilot master caution/warning panel, check that **FIRE APU** (10) indicator is lighted. On **BTL DISCHARGE/APU** panel, check that **PRI DISCH** (11), **RES DISCH** (12), and **FIRE APU PULL** (13) indicators are lighted.	If indicator(s) are not lighted, go to para 9-31-1.
5. On pilot caution/warning panels, check that **APU FAIL** (14), **APU ON** (15), **OIL PSI MAIN XMSN 1** (16), **OIL PSI MAIN XMSN 2** (17), **GEN 1** (18), **GEN 2** (19), **RECT 1** (20), **RECT 2** (21), **HOT RECT 1** (22), and **HOT RECT 2** (23) indicators are lighted.	If indicator(s) are not lighted, go to para 9-30-1.

TASK	RESULT
6. On **BTL DISCHARGE/APU** panel, hold **START** switch (25) in **START** position for three seconds and release to **RUN** position.	
7. On pilot caution/warning panel, check that **APU ON**, **OIL PSI MAIN XMSN 1** (16), and **OIL PSI MAIN XMSN 2** (17) indicators are lighted.	If **APU ON** indicator (15) is not lighted, go to chapter 15 to troubleshoot the APU. If **APU ON** indicator (15) is lighted and **OIL PSI MAIN XMSN 1** (16) and **OIL PSI MAIN XMSN 2** (17) indicators are not lighted, go to chapter 6 to troubleshoot the main transmission.
8. On **ELEC PWR** Panel, set **GEN 1** (26) and **GEN 2** (27) switches to TEST.	
9. On pilot caution/warning panel, check that **GEN 1** (18), and **GEN 2** (19)indicators are not lighted.	If **GEN 1** (18) indicator is lighted, go to para 9-2-8. If **GEN 2** (19) indicator is lighted, go to para 9-2-9.

NOTE

If AC Electrical Power Generation - FD/LS Check is to be performed, do not perform step 10, below.

TASK	RESULT
10. On **ELEC PWR** panel, set **GEN 1** and **GEN 2** switches to **GEN 1** and **GEN 2**.	

END OF TASK

9-2-4. AC ELECTRICAL POWER GENERATION - POWER DOWN

Personnel Required:

67R20 Attack Helicopter Repairer

References:

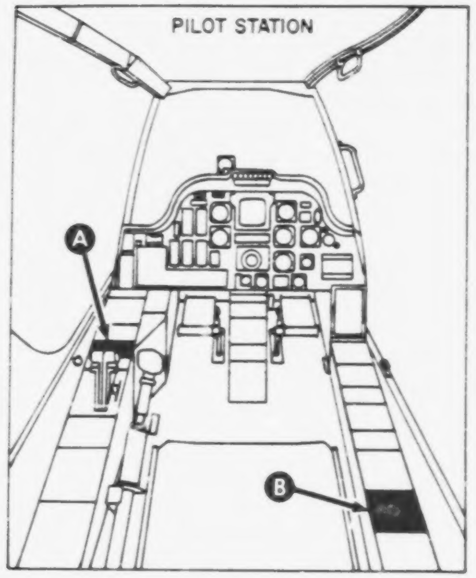
TM 55-1520-238-23

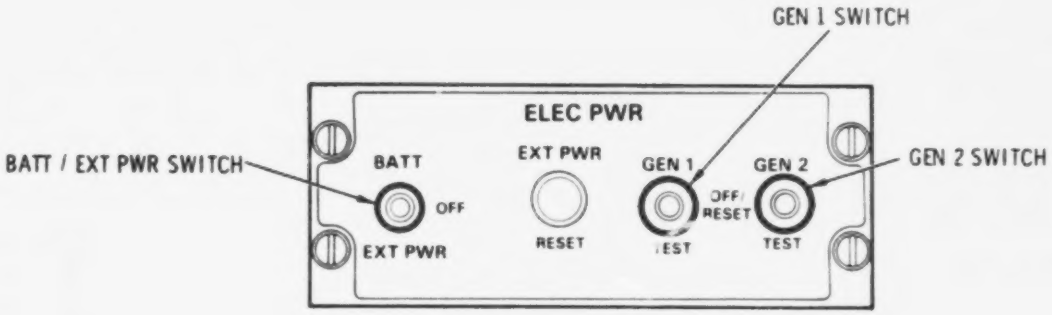
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

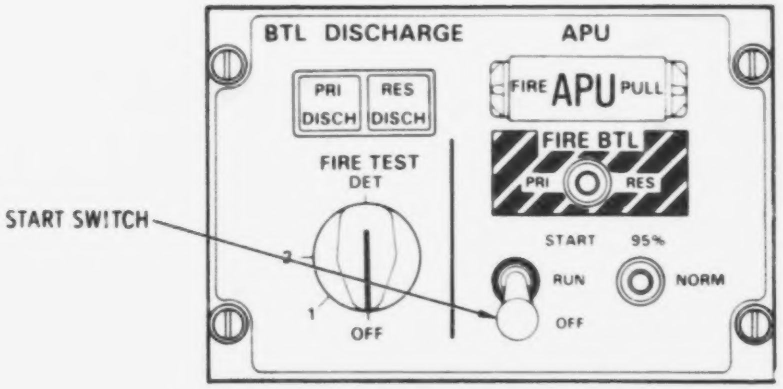
A. At pilot station, set switches and controls as follows:

Location	Switch	Position
ELEC PWR panel	**GEN 1**	**OFF**
ELEC PWR panel	**GEN 2**	**OFF**
BTL DISCHARGE/APU panel	**START**	**OFF**
ELEC PWR panel	**BATT/EXT PWR**	**OFF**





A ELEC PWR PANEL

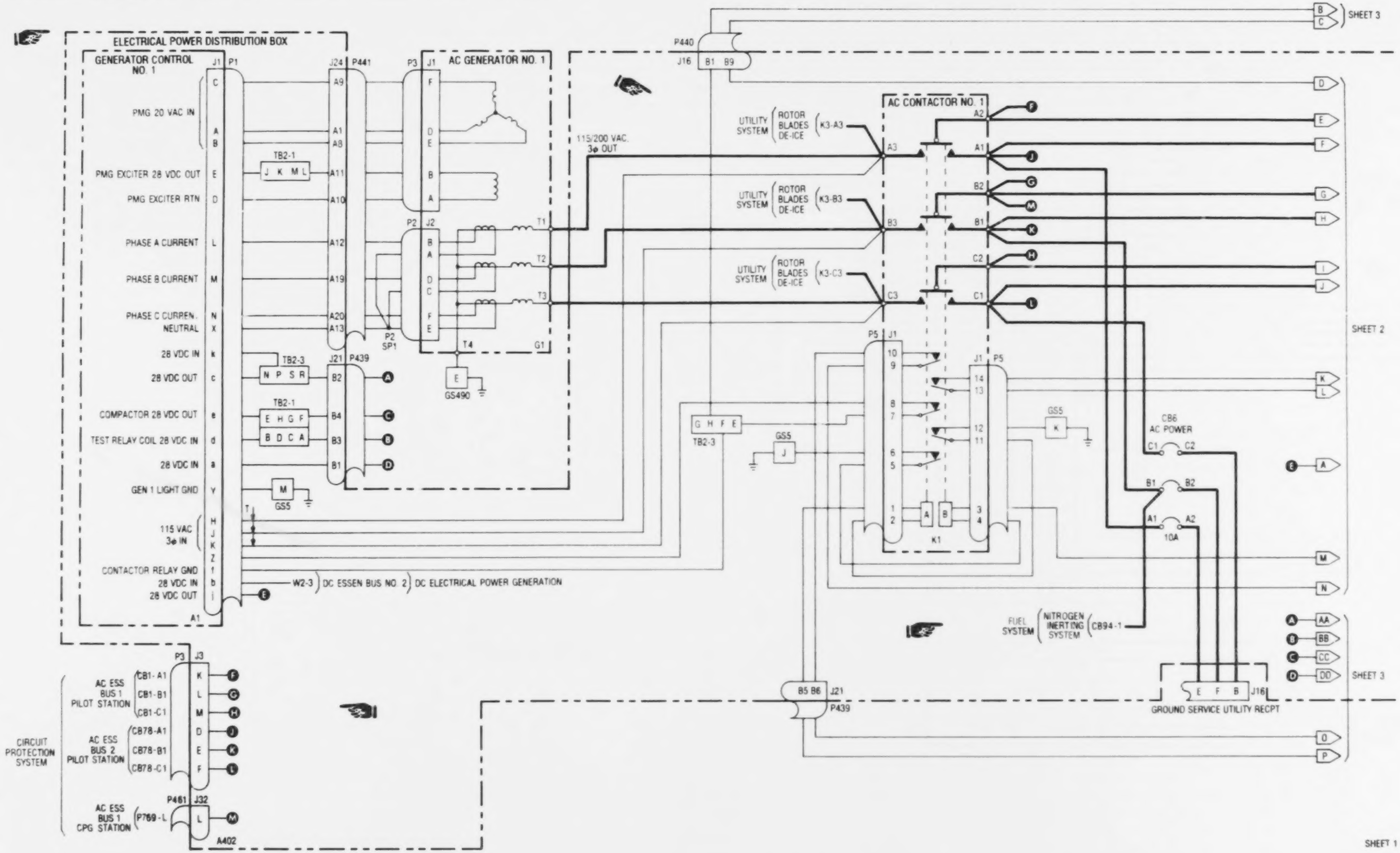


B BTL DISCHARGE / APU PANEL

MM04/1-1339

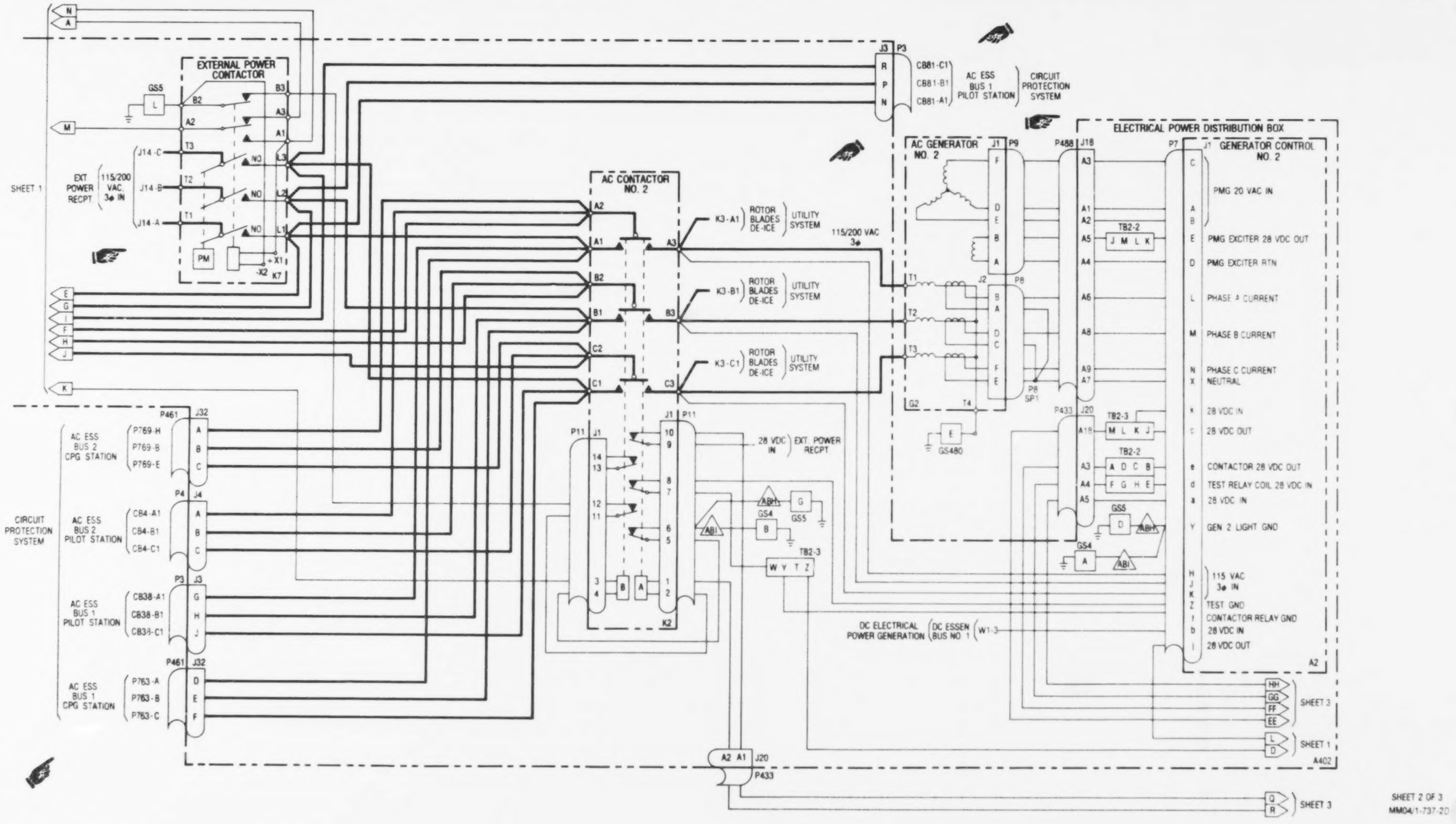
END OF TASK

9-2-5. AC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM

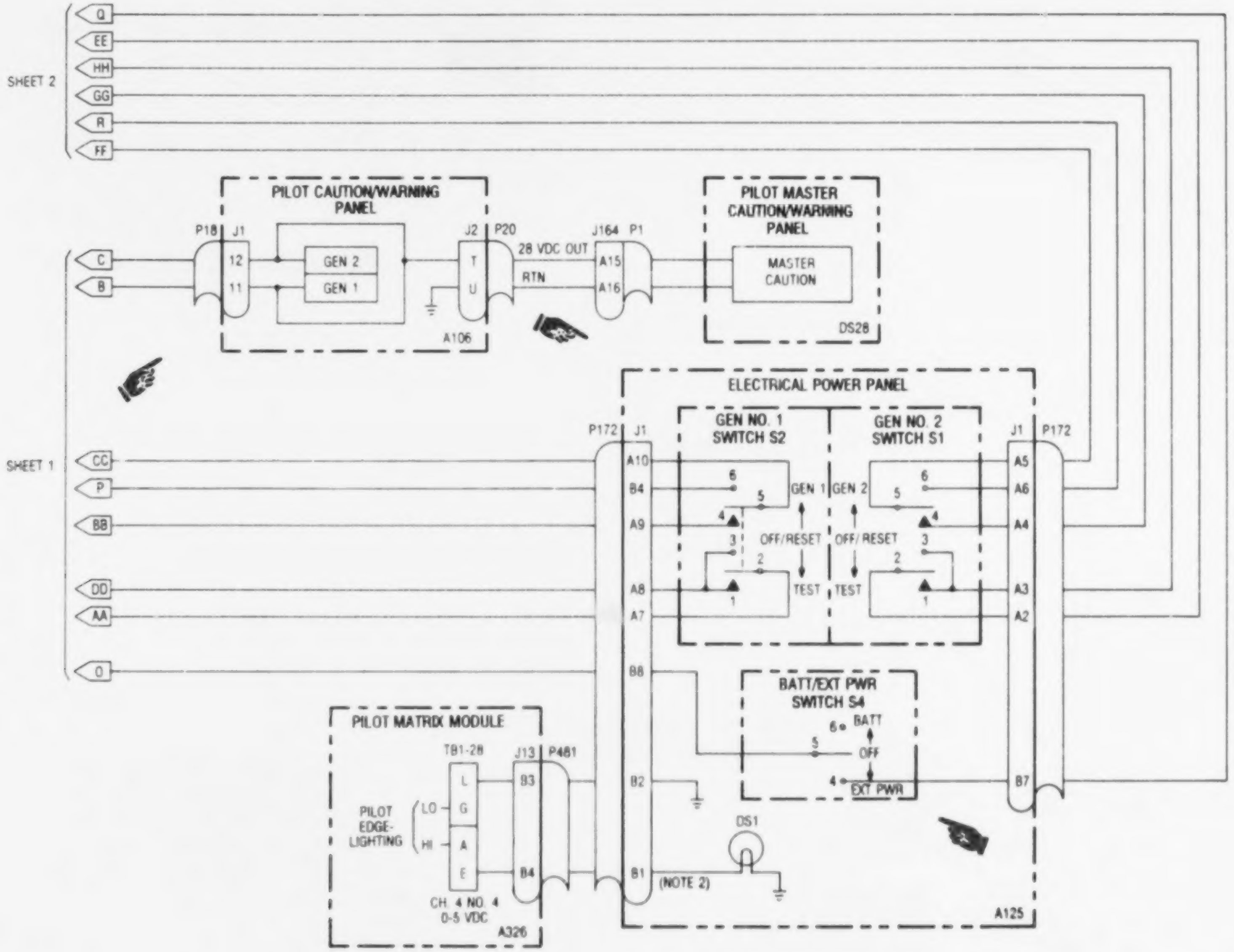


SHEET 1 OF 3 MM04/1-737-1D

9-2-5. AC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM (cont)



9-2-5. AC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM (cont)

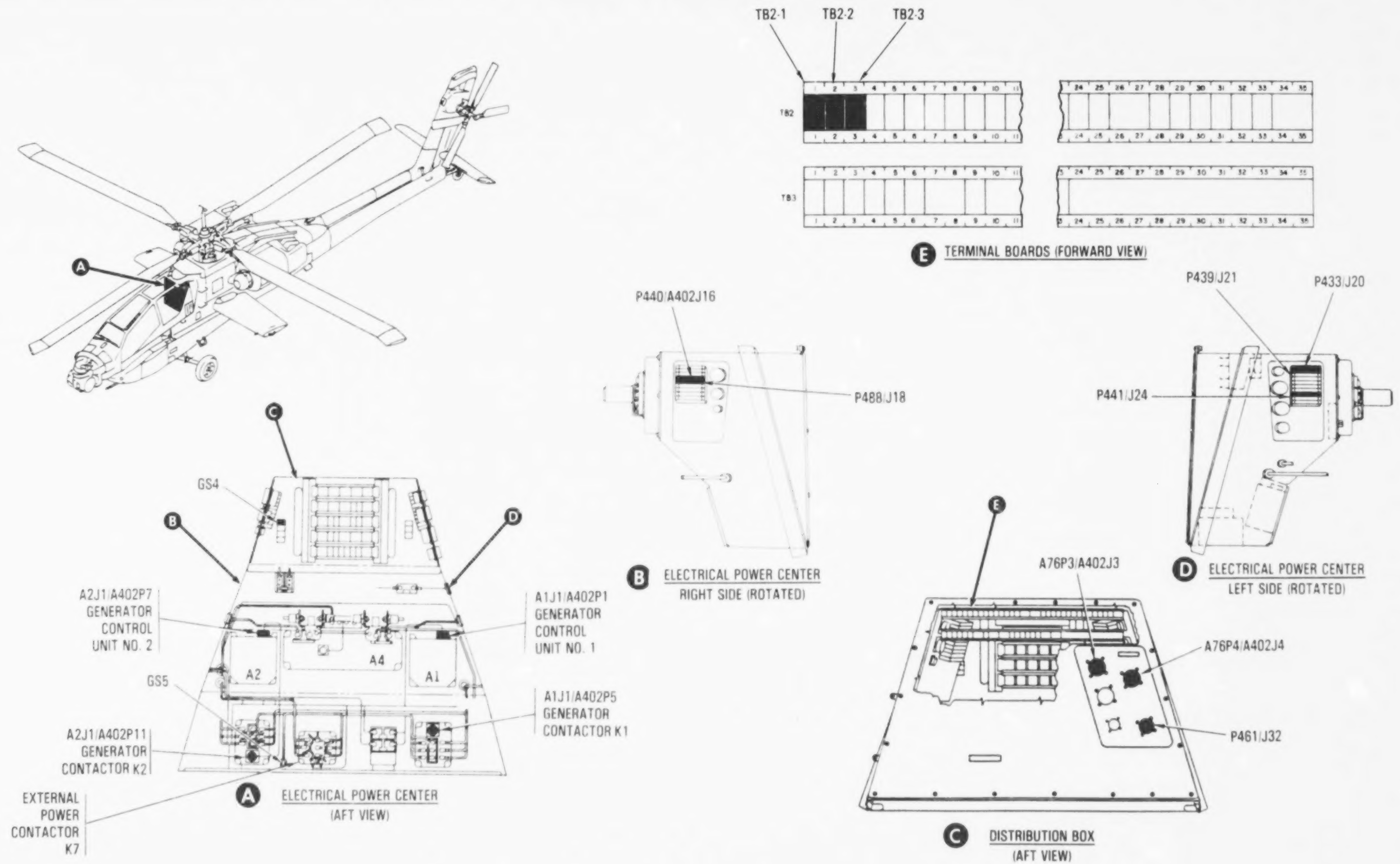


NOTE

1. FAILURE SIGNALS THAT LIGHT EITHER ONE OR BOTH GEN 1 OR GEN 2 INDICATORS ALSO LIGHT MASTER CAUTION LIGHT
2. LIGHT TRANSMITTING INDICATING PANEL MUST BE REMOVED FOR CONTINUITY CHECK.

SHEET 3 OF 3   MM04/1-737-3D

9-2-6. AC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


TB2-1
TB2-2
TB2-3
TB2
TB3
A
C
B
D
E
GS4
GS5
A2
A4
A1
A2J1/A402P7 GENERATOR CONTROL UNIT NO. 2
A1J1/A402P1 GENERATOR CONTROL UNIT NO. 1
A1J1/A402P5 GENERATOR CONTACTOR K1
A2J1/A402P11 GENERATOR CONTACTOR K2
EXTERNAL POWER CONTACTOR K7
P440/A402J16
P488/J18
P439/J21
P433/J20
P441/J24
A76P3/A402J3
A76P4/A402J4
P461/J32

A ELECTRICAL POWER CENTER (AFT VIEW)

B ELECTRICAL POWER CENTER RIGHT SIDE (ROTATED)

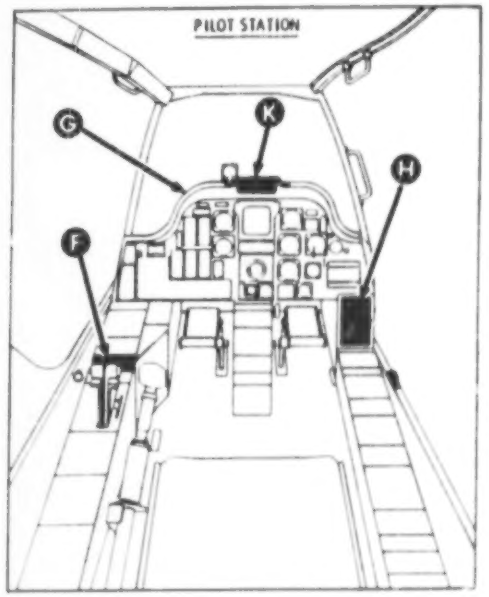
C DISTRIBUTION BOX (AFT VIEW)

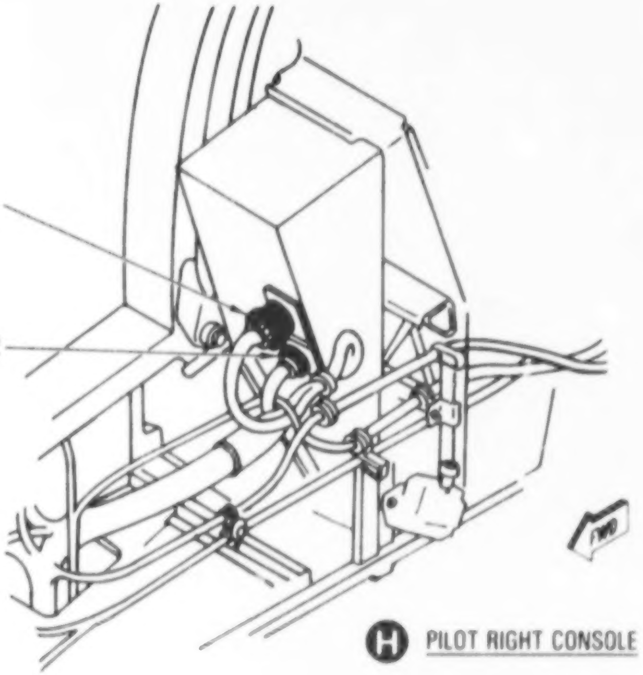
D ELECTRICAL POWER CENTER LEFT SIDE (ROTATED)

E TERMINAL BOARDS (FORWARD VIEW)

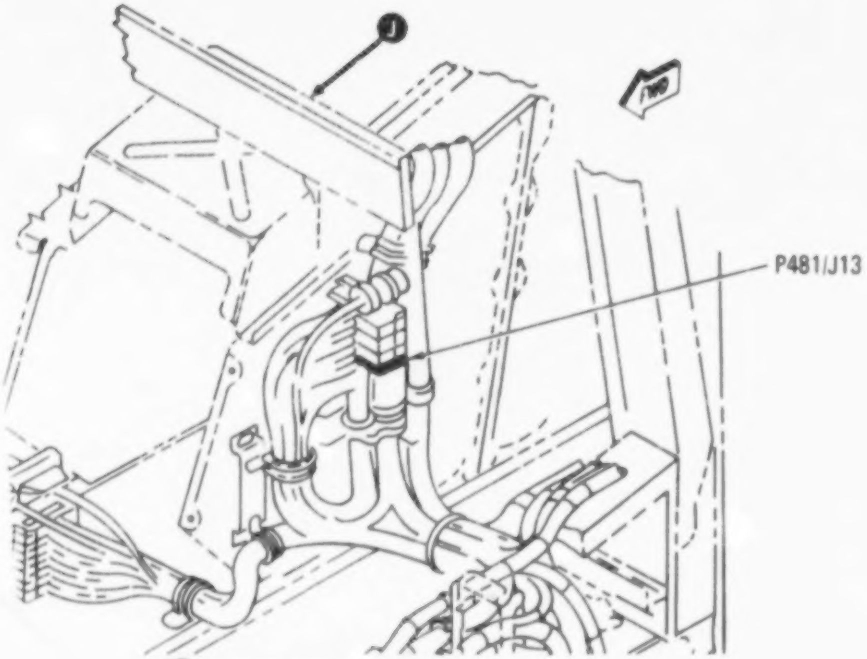
MM04/1-778-1B

9-2-6. AC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

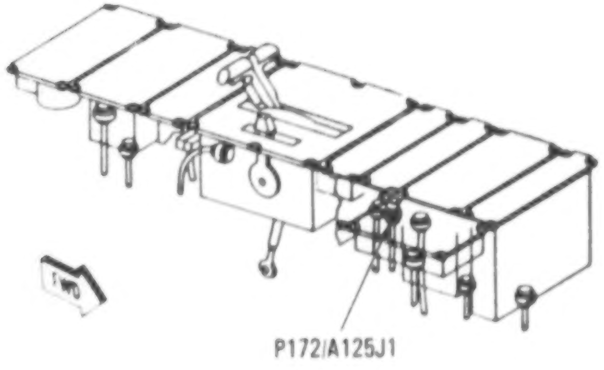




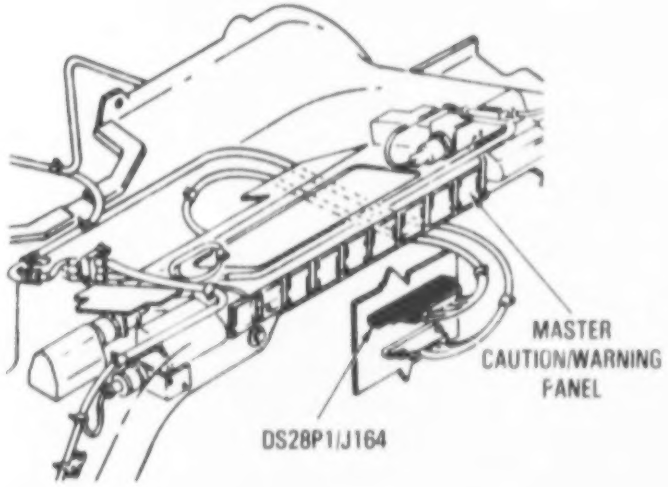
H PILOT RIGHT CONSOLE



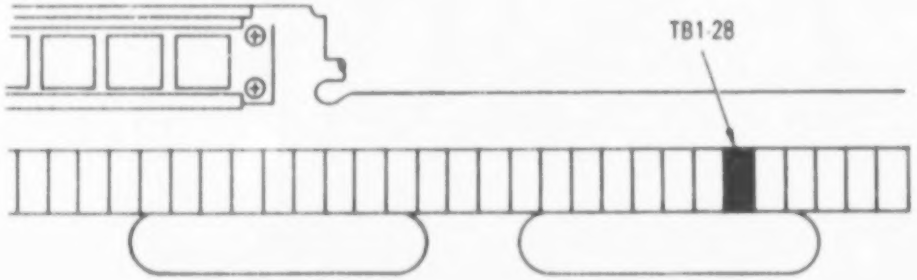
G PILOT INSTRUMENT PANEL
(AFT VIEW)



F PILOT LEFT CONSOLE



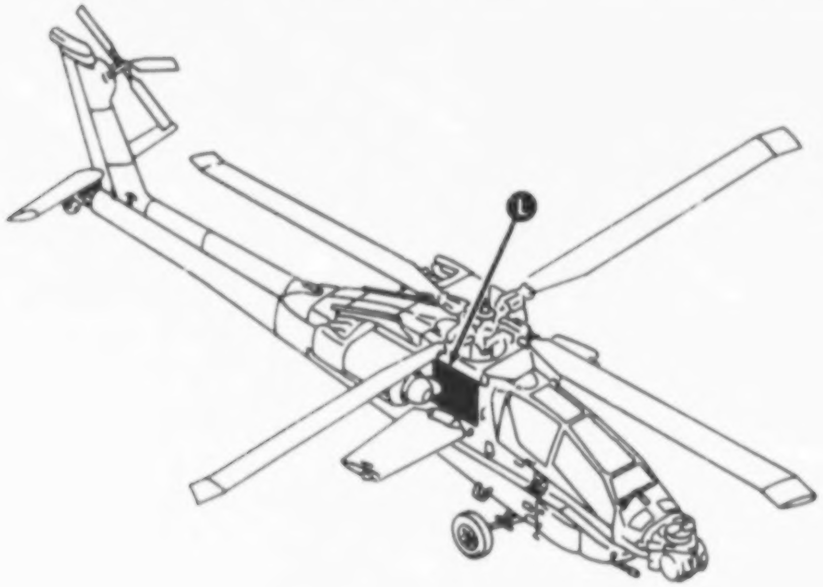
K PILOT GLARESHIELD PANEL

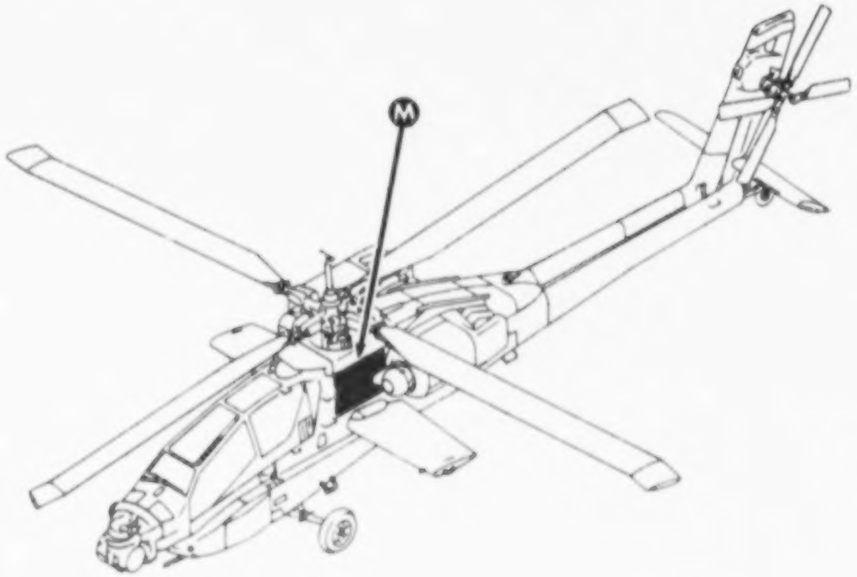


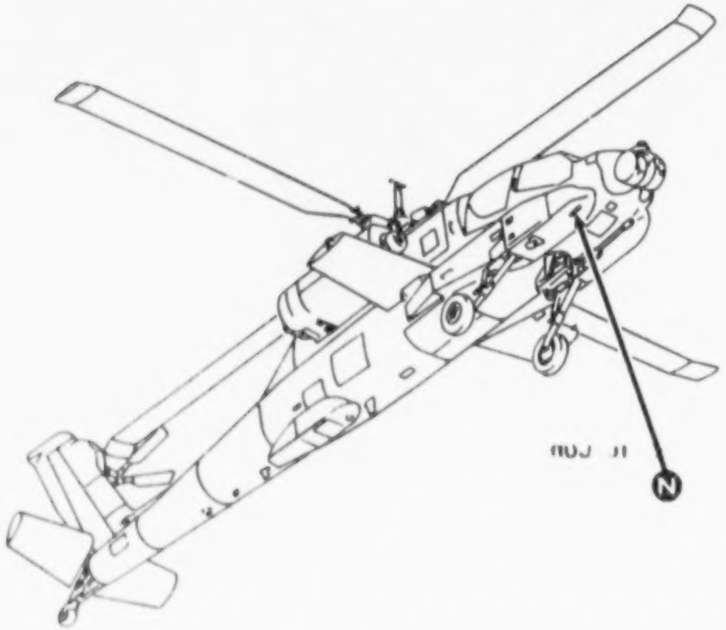
J PILOT INSTRUMENT PANEL MATRIX

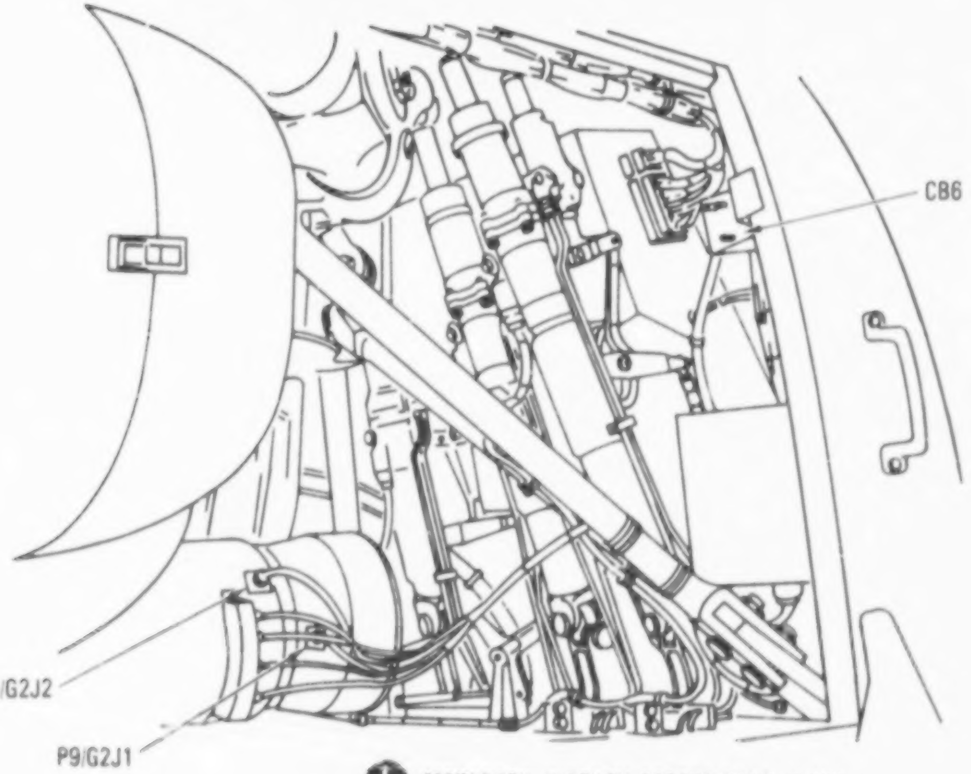
MM04/1-778-28

9-2-6. AC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

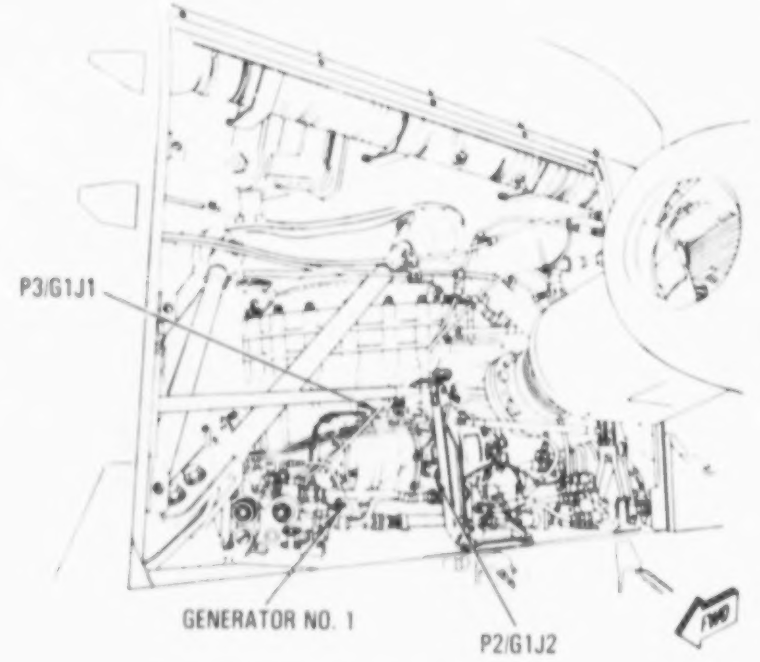




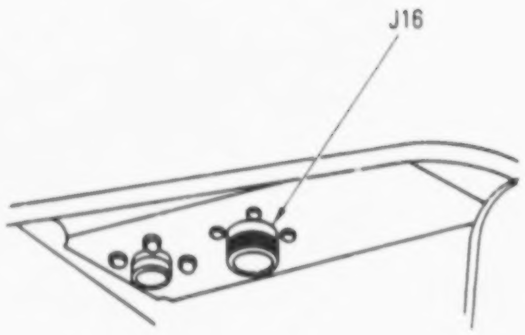




Ⓛ MAIN DECK THROUGH ACCESS PANEL R 200



Ⓜ MAIN DECK THROUGH ACCESS PANEL L200



Ⓝ GROUND SERVICE UTILITY RECEPTACLE THROUGH DOOR B 60R

MM04/1-778-3B

9-2-7. GEN 2 INDICATOR IS NOT LIGHTED WITH GENERATOR NO. 2 OFF LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

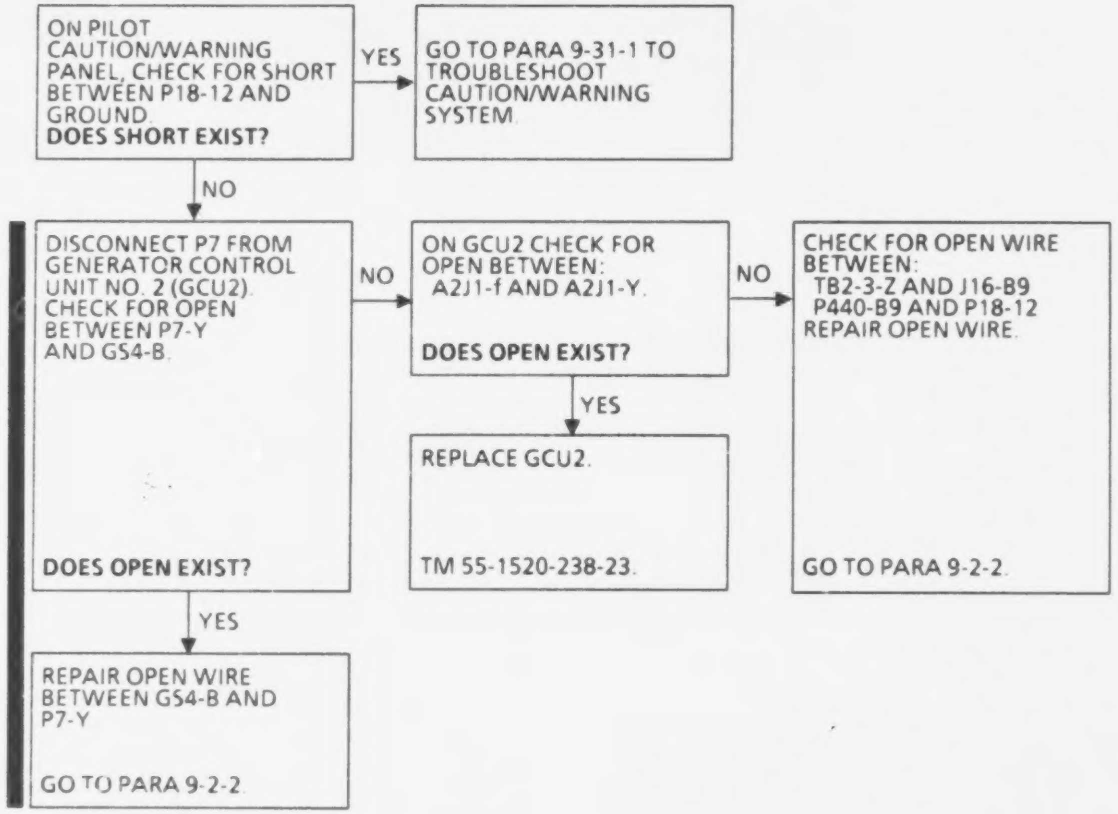
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



ON PILOT CAUTION/WARNING PANEL, CHECK FOR SHORT BETWEEN P18-12 AND GROUND. **DOES SHORT EXIST?**

YES: GO TO PARA 9-31-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

NO: DISCONNECT P7 FROM GENERATOR CONTROL UNIT NO. 2 (GCU2). CHECK FOR OPEN BETWEEN P7-Y AND GS4-B. **DOES OPEN EXIST?**

YES: REPAIR OPEN WIRE BETWEEN GS4-B AND P7-Y. GO TO PARA 9-2-2.

NO: ON GCU2 CHECK FOR OPEN BETWEEN: A2J1-f AND A2J1-Y. **DOES OPEN EXIST?**

YES: REPLACE GCU2. TM 55-1520-238-23.

NO: CHECK FOR OPEN WIRE BETWEEN: TB2-3-Z AND J16-B9 P440-B9 AND P18-12 REPAIR OPEN WIRE. GO TO PARA 9-2-2.

END OF TASK

9-2-8. GEN 1 INDICATOR IS LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

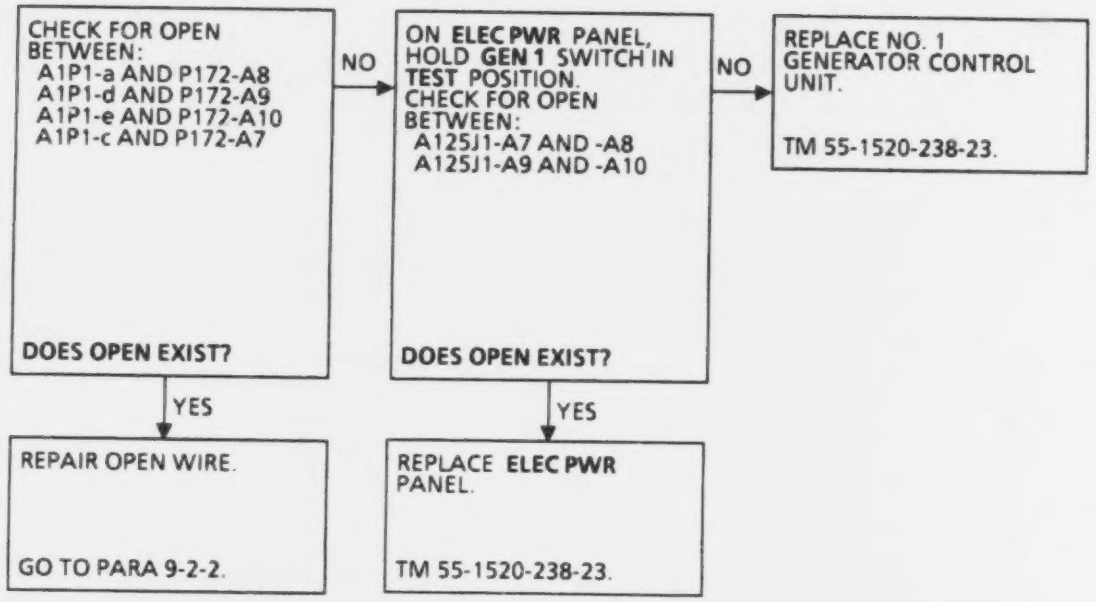
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed



CHECK FOR OPEN BETWEEN:
A1P1-a AND P172-A8
A1P1-d AND P172-A9
A1P1-e AND P172-A10
A1P1-c AND P172-A7

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA **9-2-2**.

ON **ELEC PWR** PANEL, HOLD **GEN 1** SWITCH IN **TEST** POSITION. CHECK FOR OPEN BETWEEN:
A125J1-A7 AND -A8
A125J1-A9 AND -A10

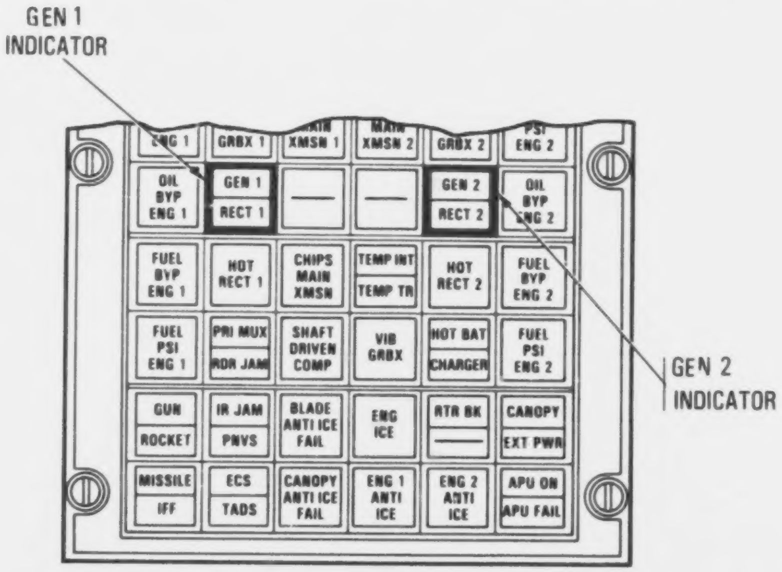
DOES OPEN EXIST?

REPLACE **ELEC PWR** PANEL.

TM 55-1520-238-23.

REPLACE NO. 1 GENERATOR CONTROL UNIT.

TM 55-1520-238-23.



PILOT CAUTION/WARNING PANEL

MM04/1-799A

END OF TASK

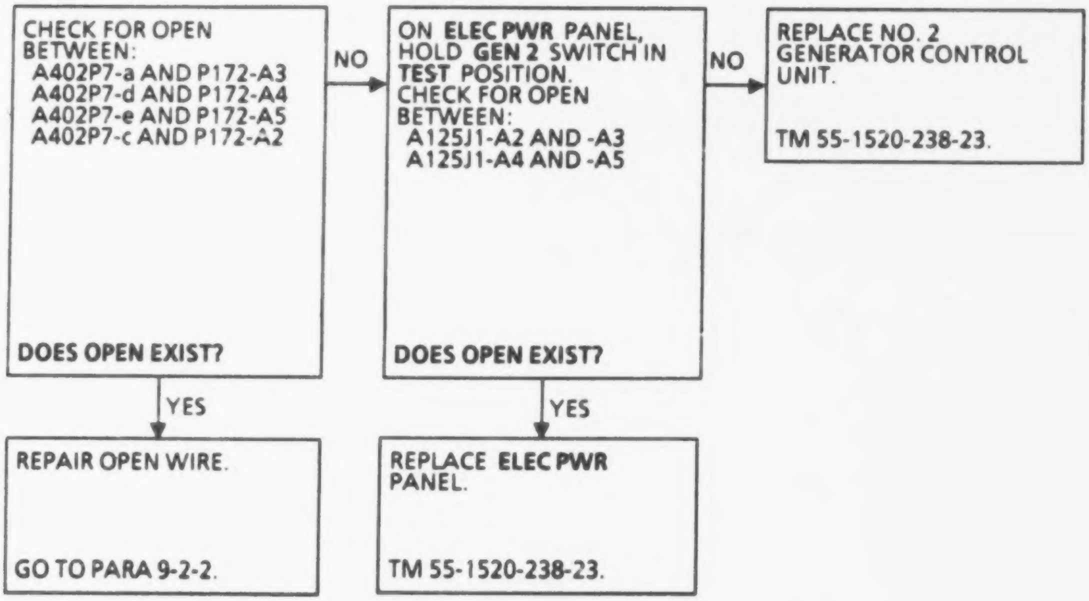
9-2-9. GEN 2 INDICATOR IS LIGHTED

Tools: (para 9-2-8)

Personnel Required: (para 9-2-8)

References: (para 9-2-8)

Equipment Conditions: (para 9-2-8)



END OF TASK

9-2-10. GEN 1 INDICATOR IS NOT LIGHTED WITH GENERATOR NO. 1 OFF LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital, AN/PSM-45	6625-01-139-2512

Personnel Required:

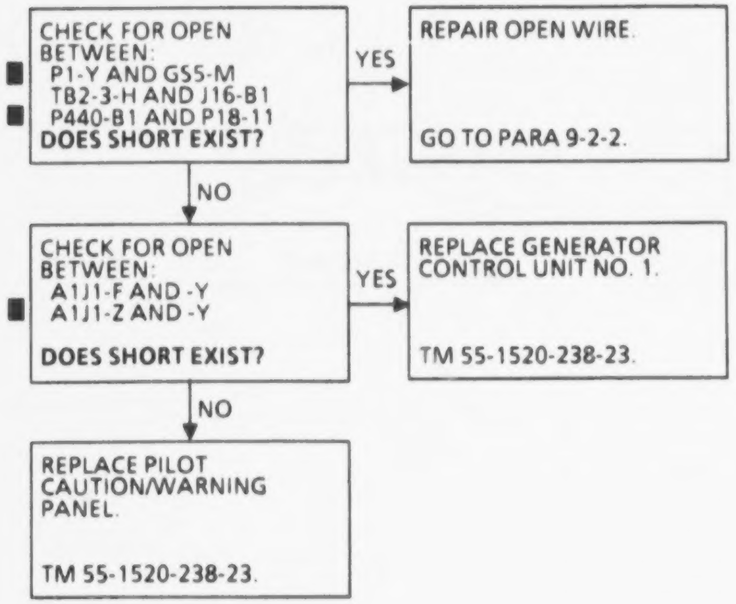
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - electrical power distribution box cover removed



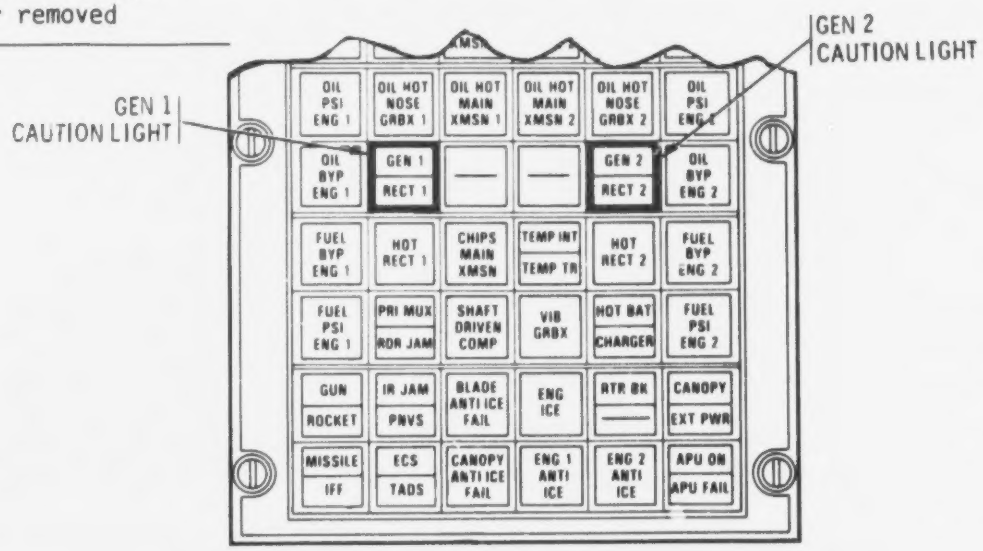
CHECK FOR OPEN BETWEEN:
P1-Y AND GS5-M
TB2-3-H AND J16-B1
P440-B1 AND P18-11
DOES SHORT EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-2-2.

NO: CHECK FOR OPEN BETWEEN:
A1J1-F AND -Y
A1J1-Z AND -Y
DOES SHORT EXIST?

YES: REPLACE GENERATOR CONTROL UNIT NO. 1. TM 55-1520-238-23.

NO: REPLACE PILOT CAUTION/WARNING PANEL. TM 55-1520-238-23.



PILOT CAUTION / WARNING PANEL

MM04/1-802A

END OF TASK

9-2-11. ELEC PWR PANEL EDGE-LIGHT DOES NOT LIGHT

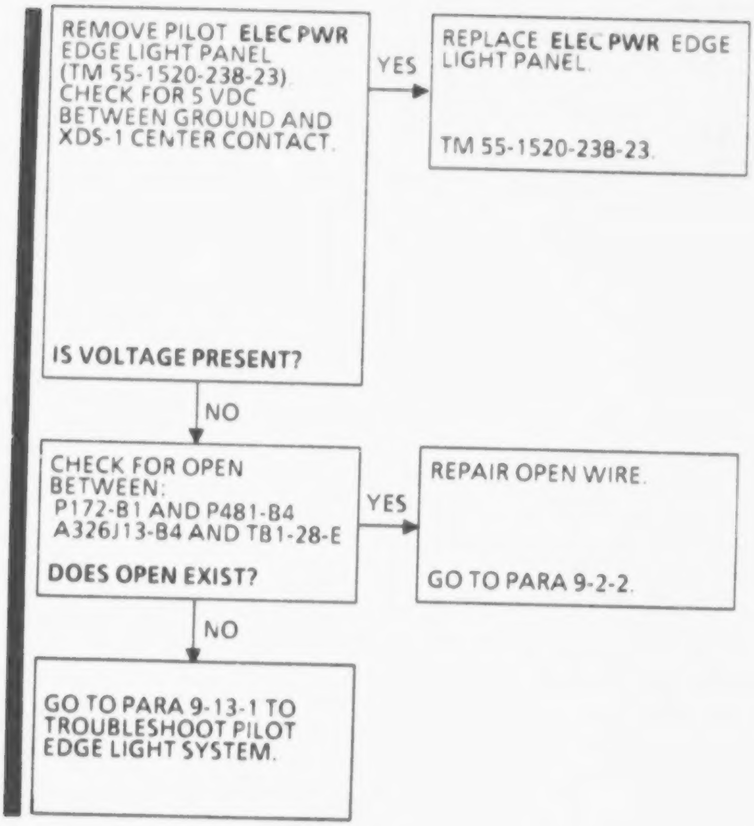
Tools: (para 9-2-10)

Personnel Required: (para 9-2-10)

References: (para 9-2-10)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed



REMOVE PILOT **ELEC PWR** EDGE LIGHT PANEL (TM 55-1520-238-23). CHECK FOR 5 VDC BETWEEN GROUND AND XDS-1 CENTER CONTACT.

IS VOLTAGE PRESENT?

REPLACE **ELEC PWR** EDGE LIGHT PANEL.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN:
P172-B1 AND P481-B4
A326J13-B4 AND TB1-28-E

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-2-2.

GO TO PARA 9-13-1 TO TROUBLESHOOT PILOT EDGE LIGHT SYSTEM.

END OF TASK

9-2-12. GEN 1 INDICATOR IS NOT LIGHTED WITH GENERATOR NO. 1 OFF LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
67R10 Attack Helicopter Repairer

References:

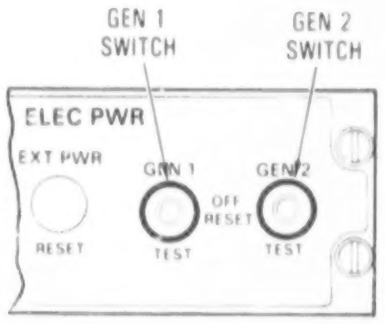
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - electrical power distribution box cover removed
Para 9-2-3	AC ELECTRICAL POWER GENERATION - POWER UP performed

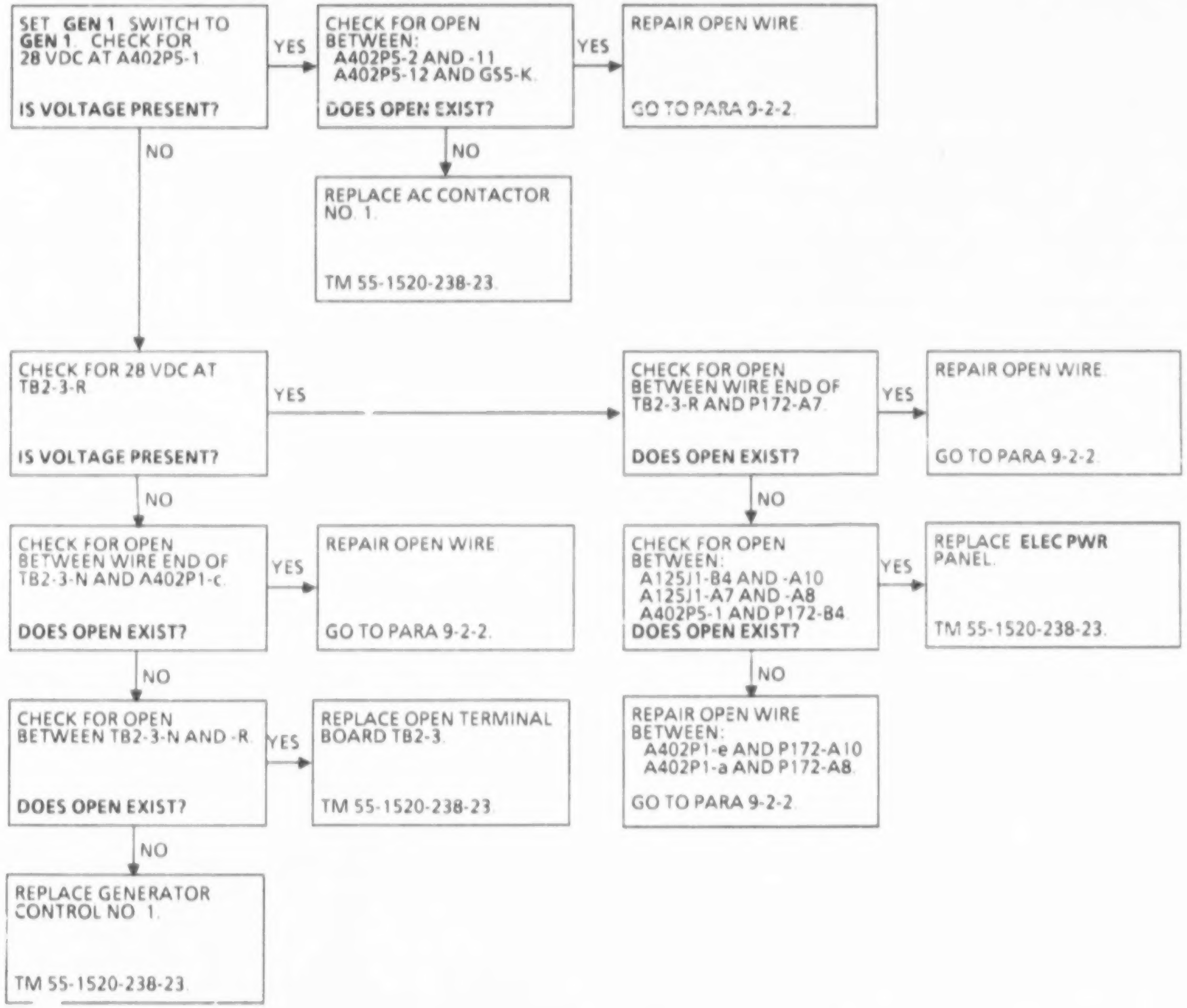
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ELEC PWR PANEL

MM04/1-920


SET GEN 1 SWITCH TO GEN 1. CHECK FOR 28 VDC AT A402P5-1. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: A402P5-2 AND -11 A402P5-12 AND GS5-K. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
REPLACE AC CONTACTOR NO. 1. TM 55-1520-238-23.
NO
CHECK FOR 28 VDC AT TB2-3-R. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN WIRE END OF TB2-3-R AND P172-A7. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN: A125J1-B4 AND -A10 A125J1-A7 AND -A8 A402P5-1 AND P172-B4. DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL. TM 55-1520-238-23.
NO
REPAIR OPEN WIRE BETWEEN: A402P1-e AND P172-A10 A402P1-a AND P172-A8. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN WIRE END OF TB2-3-N AND A402P1-c. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN TB2-3-N AND -R. DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB2-3. TM 55-1520-238-23.
NO
REPLACE GENERATOR CONTROL NO 1. TM 55-1520-238-23.

END OF TASK

9-2-13. WITH GEN 2 SWITCH IN GEN 2 POSITION - GEN 2 INDICATOR IS LIGHTED

Tools: (para 9-2-12)

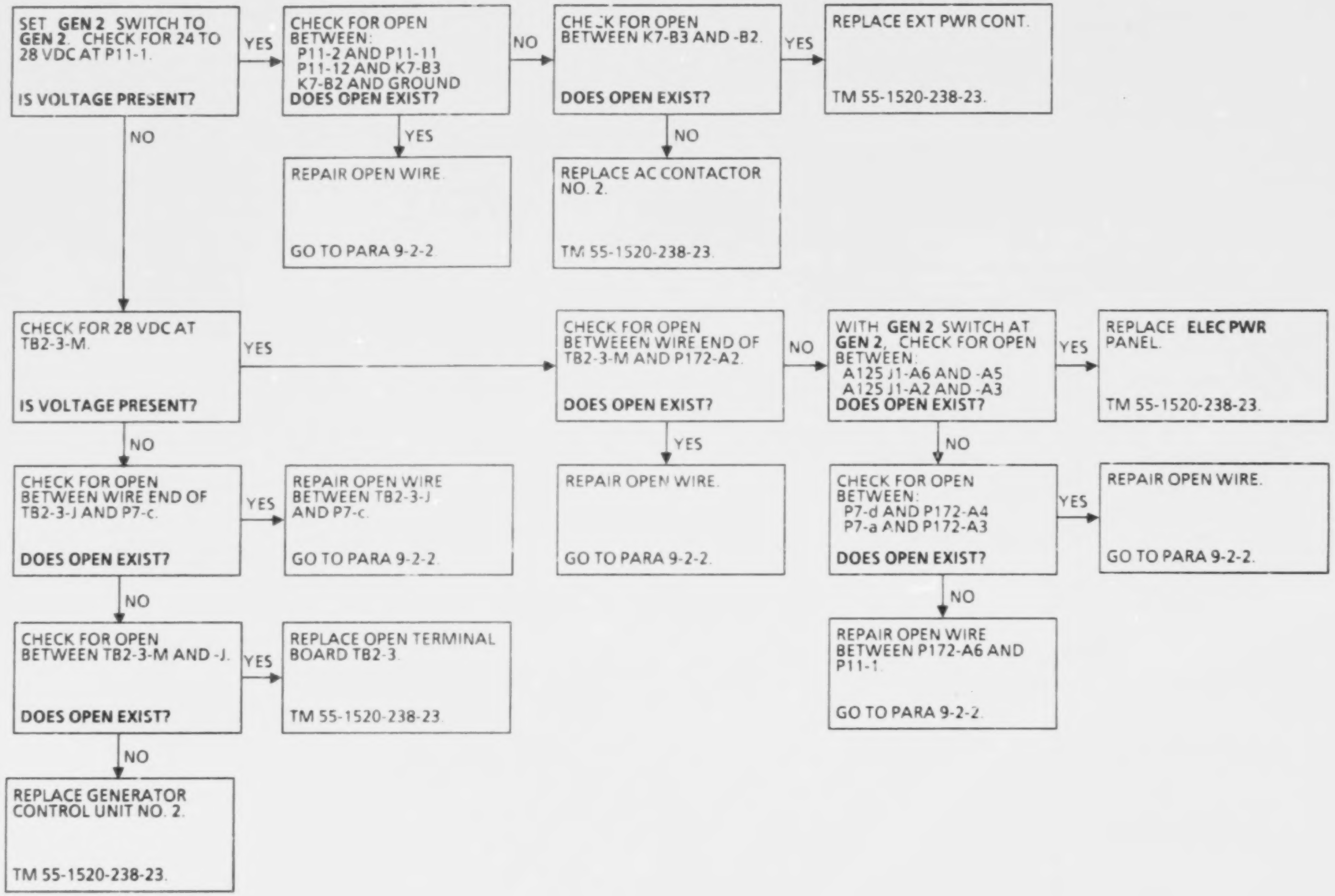
Personnel Required: (para 9-2-12)

References: (para 9-2-12)

Equipment Conditions: (para 9-2-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


SET GEN 2 SWITCH TO GEN 2. CHECK FOR 24 TO 28 VDC AT P11-1. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P11-2 AND P11-11 P11-12 AND K7-B3 K7-B2 AND GROUND DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN K7-B3 AND -B2. DOES OPEN EXIST?
YES
REPLACE EXT PWR CONT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
REPLACE AC CONTACTOR NO. 2. TM 55-1520-238-23.
NO
CHECK FOR 28 VDC AT TB2-3-M. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEEN WIRE END OF TB2-3-M AND P172-A2. DOES OPEN EXIST?
NO
WITH GEN 2 SWITCH AT GEN 2, CHECK FOR OPEN BETWEEN: A125 J1-A6 AND -A5 A125 J1-A2 AND -A3 DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN WIRE END OF TB2-3-J AND P7-c. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN TB2-3-J AND P7-c. GO TO PARA 9-2-2.
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN: P7-d AND P172-A4 P7-a AND P172-A3 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-2-2.
NO
CHECK FOR OPEN BETWEEN TB2-3-M AND -J. DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB2-3. TM 55-1520-238-23
NO
REPAIR OPEN WIRE BETWEEN P172-A6 AND P11-1. GO TO PARA 9-2-2.
NO
REPLACE GENERATOR CONTROL UNIT NO. 2. TM 55-1520-238-23.

END OF TASK

best copy available
Reproduced from poor document

9-2-14. RECT 1 INDICATOR - IS LIGHTED WITH GEN 1 SWITCH OFF

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

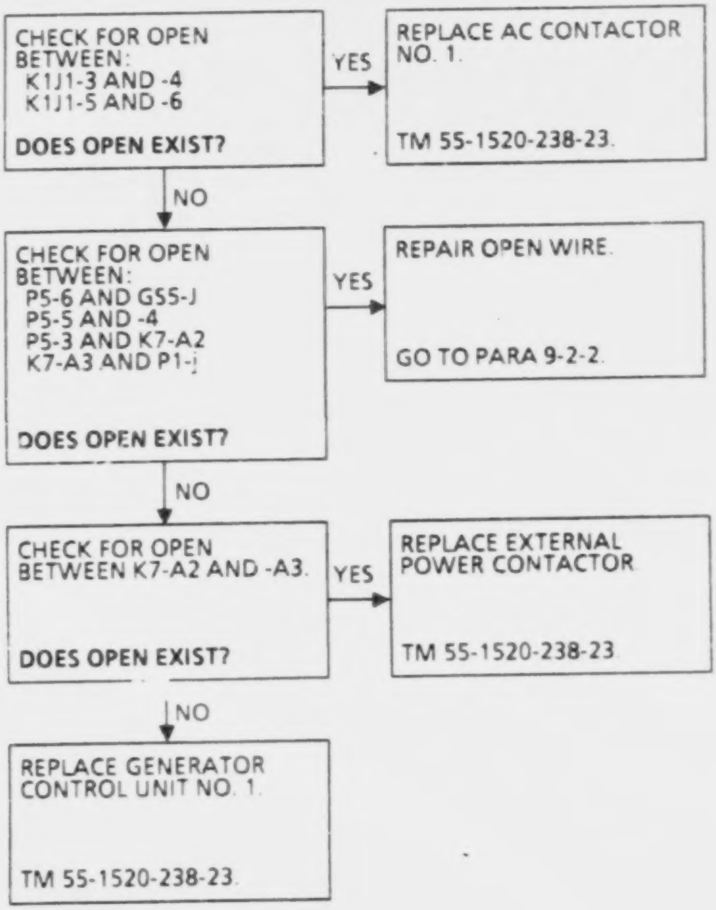
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - electrical power center cover removed



END OF TASK

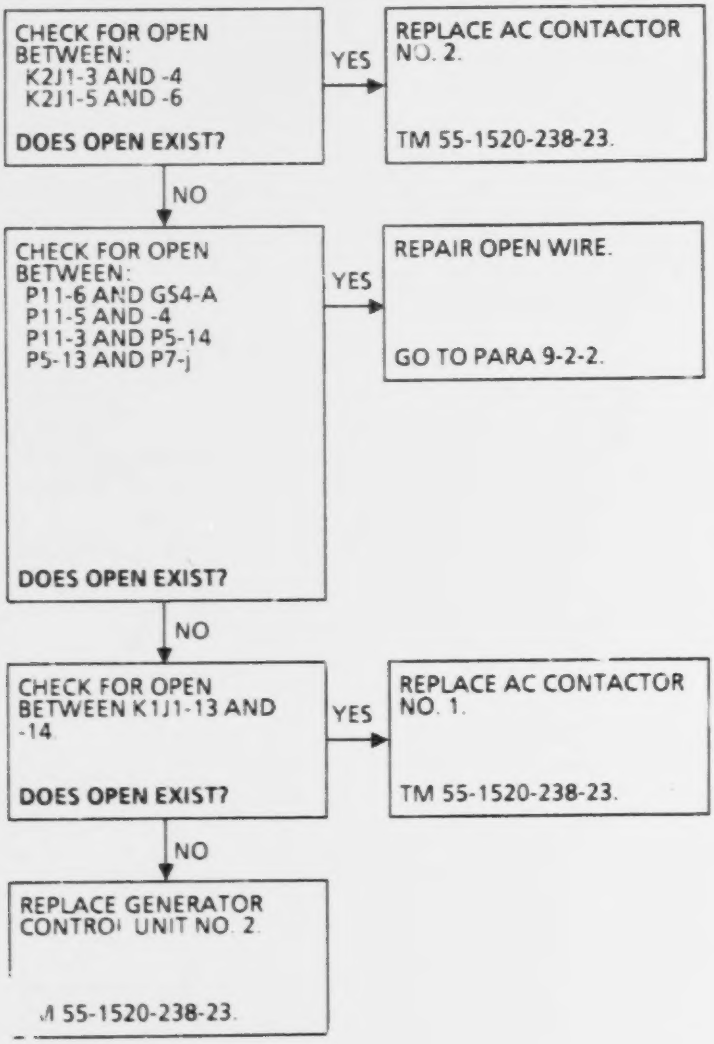
9-2-15. RECT 2 INDICATOR IS LIGHTED WITH GEN 2 SWITCH OFF AND GEN 1 SWITCH AT GEN 1

Tools: (para 9-2-14)

References: (para 9-2-14)

Personnel Required: (para 9-2-14)

Equipment Conditions: (para 9-2-14)



END OF TASK

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

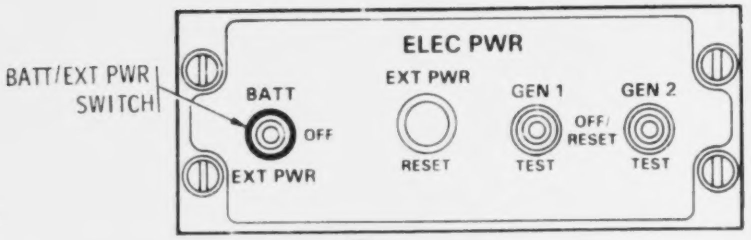
TM 55-1520-238-23

Equipment Conditions:

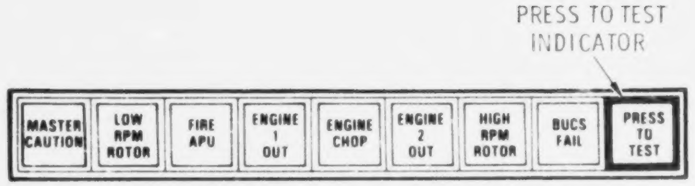
Ref	Condition
TM 55-1520-238-23	Helicopter safed Electrical Power Distribution Box Cover Removed

WARNING

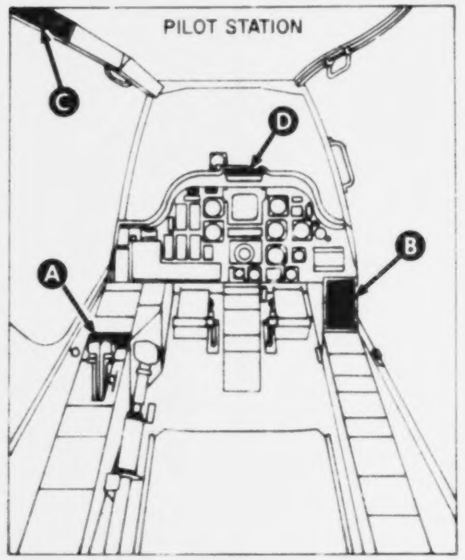
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

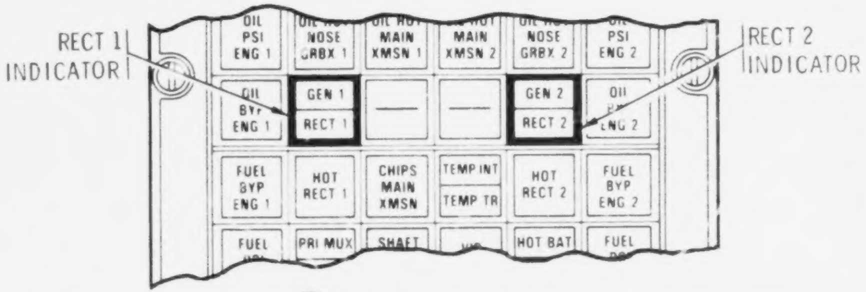


A PILOT ELEC PWR PANEL

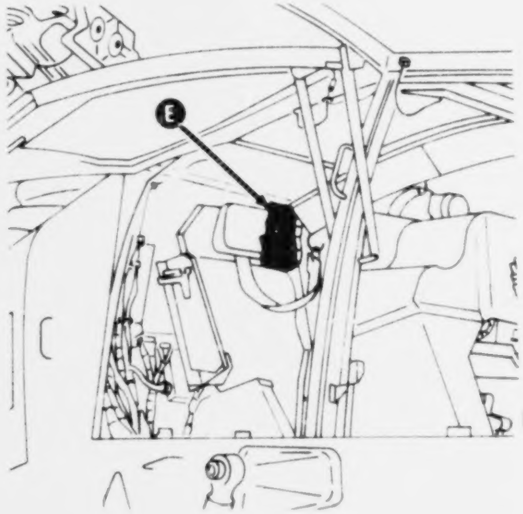


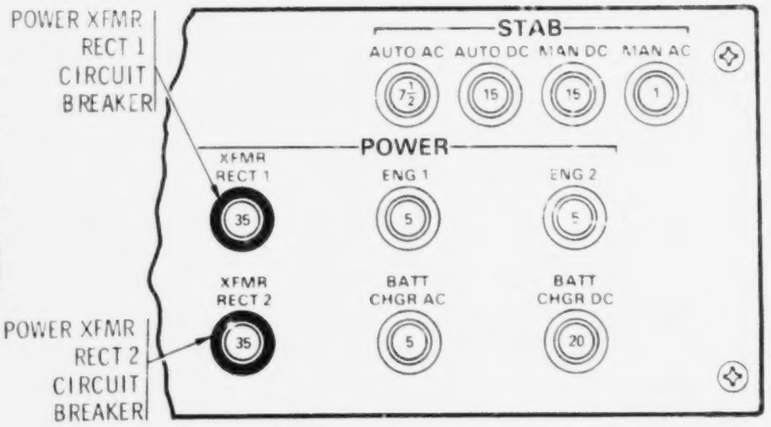
D PILOT MASTER CAUTION/WARNING PANEL





B PILOT CAUTION/WARNING PANEL



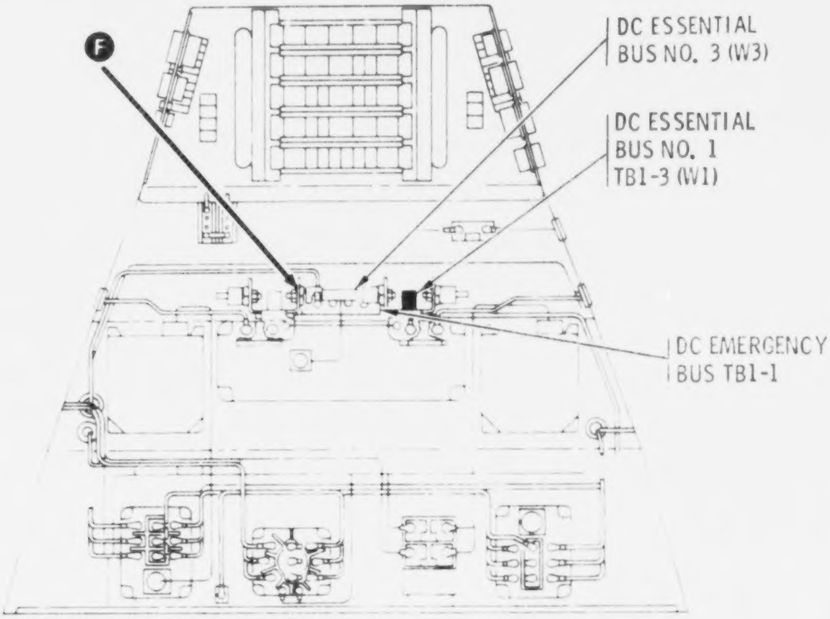


C PILOT AFT CIRCUIT BREAKER PANEL

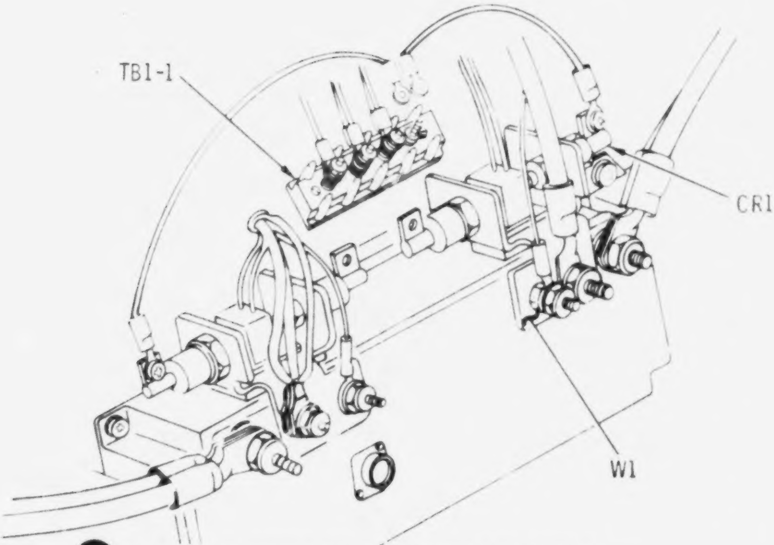
MM04/1-812-1

GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)


F
DC ESSENTIAL BUS NO. 3 (W3)
DC ESSENTIAL BUS NO. 1 TB1-3 (W1)
DC EMERGENCY BUS TB1-1

Ⓔ ELECTRICAL POWER DISTRIBUTION BOX
(FORWARD VIEW)



Ⓕ ELECTRICAL POWER DISTRIBUTION BOX DETAIL
(DC ESSENTIAL BUS NO. 3
REMOVED FOR CLARITY)

MM04/1-812-2A

9-3-1

A. Perform operational check as follows:

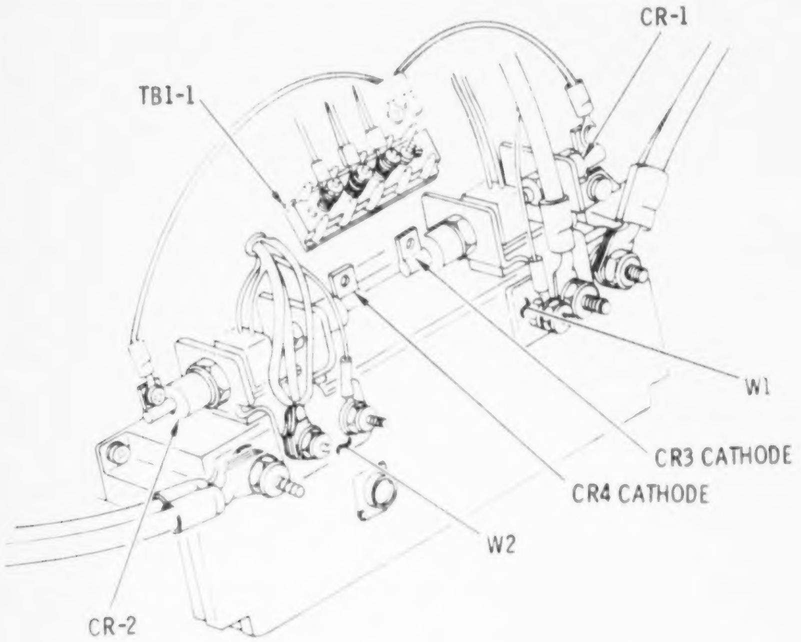
TASK	RESULT
1. Connect battery (TM 55-1520-238-23).	
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch to **BATT**.	
3. On master caution/warning panel, depress **PRESS TO TEST** indicator. Verify that all indicators are illuminated.	If no caution/warning indicators are illuminated, to to para 9-4-4. If some caution/warning indicators are illuminated and others are not, go to para 9-31-1.
4. Set **BATT/EXT PWR** switch to **OFF**.	
5. Disconnect battery (TM 55-1520-238-23).	
6. Perform EXTERNAL POWER APPLICATION - ELECTRICAL (TM 55-1520-238-23).	
7. Ensure the **POWER XFMR RECT 1** and **POWER XFMR RECT 2** circuit breakers are closed.	If both circuit breakers do not stay closed, go to para 9-3-10. If **POWER XFMR RECT 1** circuit breaker, does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** circuit breaker, does not stay closed, go to para 9-3-7.
8. On master caution/warning panel, depress **PRESS TO TEST** indicator. Verify that **RECT 1** and **RECT 2** indicators are lighted.	If **RECT 1** indicator is not lighted go to para 9-3-19. If **RECT 2** indicator is not lighted go to para 9-3-20.
9. Set **BATT/EXT PWR** switch to **OFF**.	

WARNING

Place AC CONTACTOR switch on GSE to OPEN position.

TASK	RESULT
10. Disconnect wires from TB1-1-D.	
11. Perform continuity check of CR1. Place positive meter lead on bus (W1) and negative meter lead on wire end of CR1 that attaches to TB1-1-D.	If continuity does not exist, go to para 9-3-12.

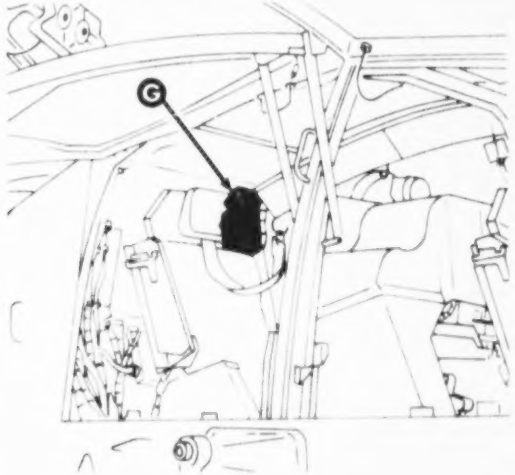
GO TO NEXT PAGE

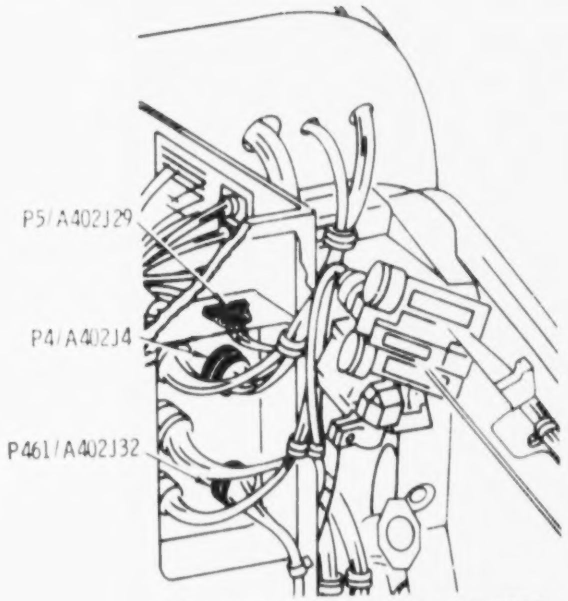


ELECTRICAL POWER DISTRIBUTION BOX DETAIL
(DC ESSENTIAL BUS NO. 3
REMOVED FOR CLARITY)

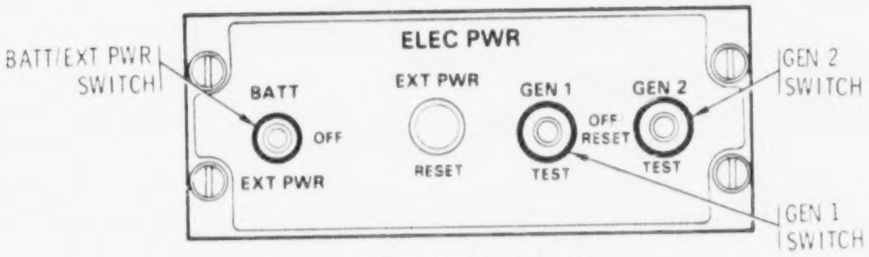
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

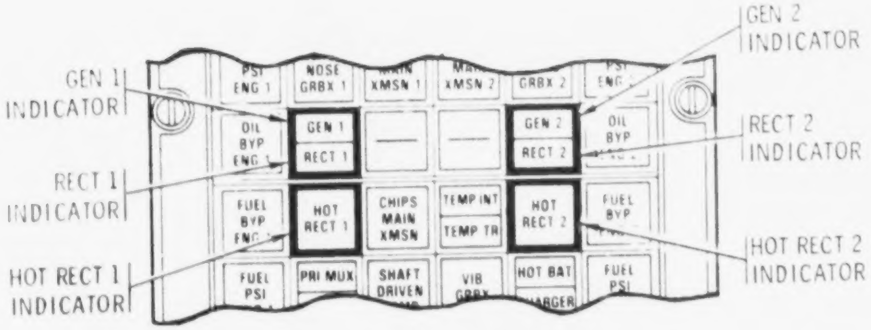




G CIRCUIT BREAKER CONNECTORS
ON ELECTRICAL POWER
DISTRIBUTION BOX



PILOT ELEC PWR PANEL



PILOT CAUTION/WARNING PANEL

MM04/1-812-3

GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

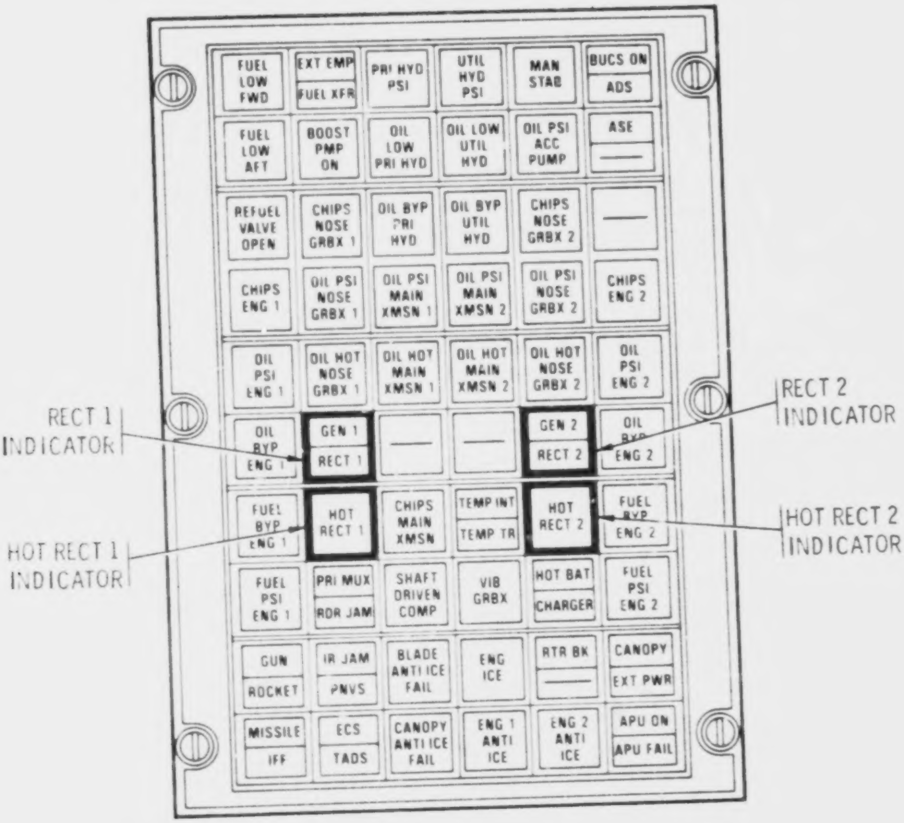
TASK	RESULT
12. Check reverse flow of CR1. Place negative meter lead on bus (W1) and positive meter lead on wire end of CR1 that attaches to TB1-1-D.	If continuity exists, replace diode CR1 (TM 55-1520-238-23).
13. Perform continuity check of CR2. Place positive meter lead on bus (W2) and negative meter lead on wire end of CR2 that attaches to TB1-1-D.	If continuity does not exist, go to para 9-3-15.
14. Check reverse flow of CR2. Place negative meter lead on bus (W2) and positive meter lead on wire end of CR2 that attaches to TB1-1-D.	If continuity exists, replace diode CR2 (TM 55-1520-238-23).
15. Reconnect wires to TB1-1-D.	
16. Disconnect DC Essential Bus 3 (W3) from CR3 and CR4.	
17. Perform continuity check of CR3. Place positive meter lead on bus (W1) and negative meter lead on CR3 cathode.	If continuity does not exist, replace diode CR3 (TM 55-1520-238-23).
18. Check reverse flow of CR3. Place negative meter lead on bus (W1) and positive meter lead on CR3 cathode.	If continuity exists,replace diode CR3 (TM 55-1520-238-23).
19. Perform continuity check of CR4. Place positive meter lead on bus (W2) and negative meter lead on CR4 cathode.	If continuity does not exist, replace diode CR4 (TM 55-1520-238-23).
20. Check reverse flow of CR4. Place negative meter lead on bus (W2) and positive meter lead on CR4 cathode.	If continuity exists, replace diode CR4 (TM 55-1520-238-23).
21. Reconnect both ends of DC Essential Bus 3 (W3) to CR3 and CR4.	
22. Disconnect P4, P5, and P461 on the electrical power distribution box.	
23. Set **BATT/EXT PWR** switch to **EXT PWR**.	

TASK	RESULT
24. Check for 28 vdc at A402J4-M, -N, and A402J32-K (DC essential bus 1).	If voltage is not present at A402J32-K, A402J4-M, and -N, go to para 9-3-13. If voltage is not present on one pin and present on the others, go to para 9-3-4.
25. Check for 28 vdc at A402J4-G and A402J4-J (DC essential bus 2).	If voltage is not present at A402J32-G, and -J, go to para 9-3-14. If voltage is not present on one pin and present on the other, go to para 9-3-5.
26. Check for 28 vdc at A402J4-K, -L, A402J32-H, and -J (DC essential bus 3).	If voltage is not present at A402J32-H, and -J, A402J4-K and -L, go to para 9-3-15. If voltage is not present on one pin and present on the others, go to para 9-3-16.
27. Check for 28 vdc at A402J29-1, -2, -3 and A402J32-G (DC emergency bus).	If voltage is not present on one pin and is present on the others, go to para 9-3-11.
28. Set **BATT/EXT PWR** switch to **OFF**.	
29. Reconnect P4, P5, and P461 to their mating connectors. Install cover on electrical power distribution box.	
30. Perform steps 1 thru 11 of APU OPERATING INSTRUCTIONS - USING EXTERNAL POWER procedures (TM 55-1520-238-23).	
31. On **ELEC PWR** panel hold **GEN 1** switch in **TEST** position. **GEN 1** indicator on caution/warning panel is not lighted.	If **GEN 1** indicator is lighted, go to para 9-2-8.
32. Release **GEN 1** switch and hold **GEN 2** switch in **TEST** position. **GEN 2** indicator on caution/warning panel is not lighted.	If **GEN 2** indicator is lighted, go to para 9-2-9.

GO TO NEXT PAGE

9-3-1. DC ELECTRICAL POWER GENERATION - OPERATIONAL CHECK (cont)

TASK	RESULT
33. Release **GEN 2** switch. Place **GEN 1** switch to **GEN 1**. **RECT 1** and **HOT RECT 1** indicators on caution/warning panel are not lighted.	If **RECT 1** indicator is lighted, go to para 9-3-8. If **HOT RECT 1** indicator is lighted, go to para 9-3-17.
34. Set **GEN 2** switch to **GEN 2**. **RECT 2** and **HOT RECT 2** indicators on caution/warning panel are not lighted.	If **RECT 2** indicator is lighted, go to para 9-3-9. If **HOT RECT 2** indicator is lighted, go to para 9-3-18.
35. Perform steps 14 thru 19 of APU OPERATING INSTRUCTIONS - USING EXTERNAL POWER procedures (TM 55-1520-238-23).	

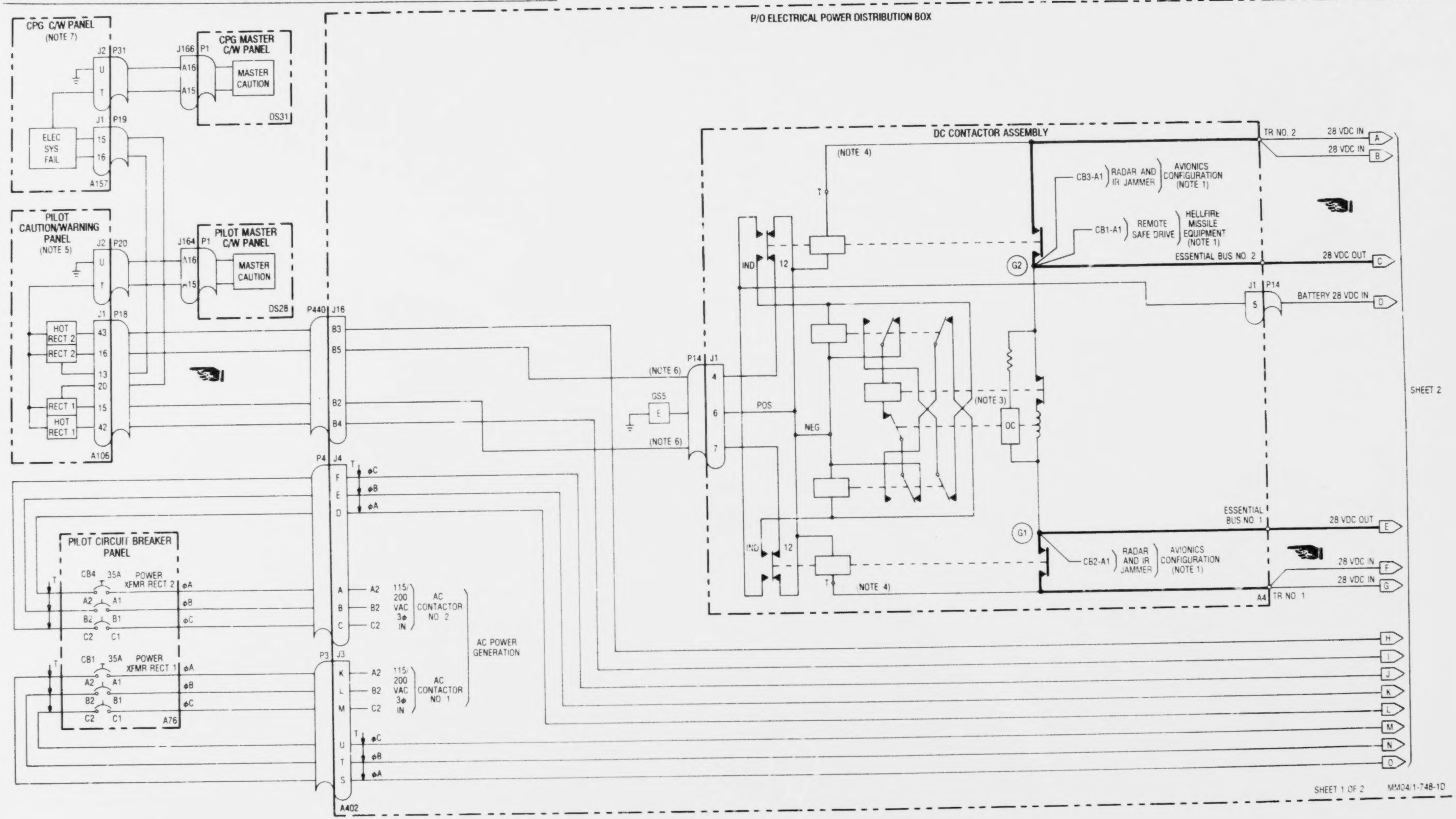


PILOT CAUTION/WARNING PANEL

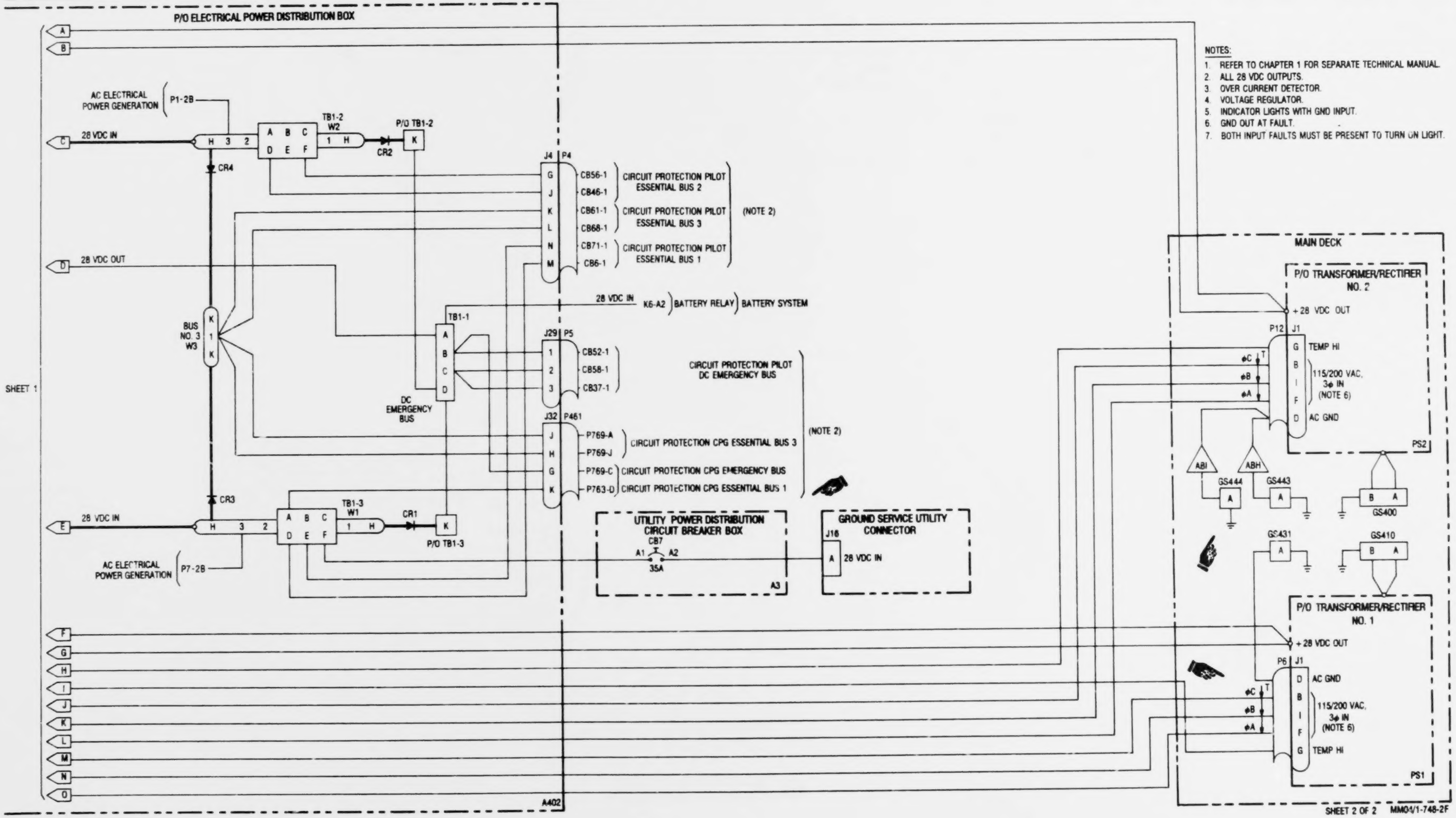
MM04/1-812-4

END OF TASK

9-3-2. DC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM



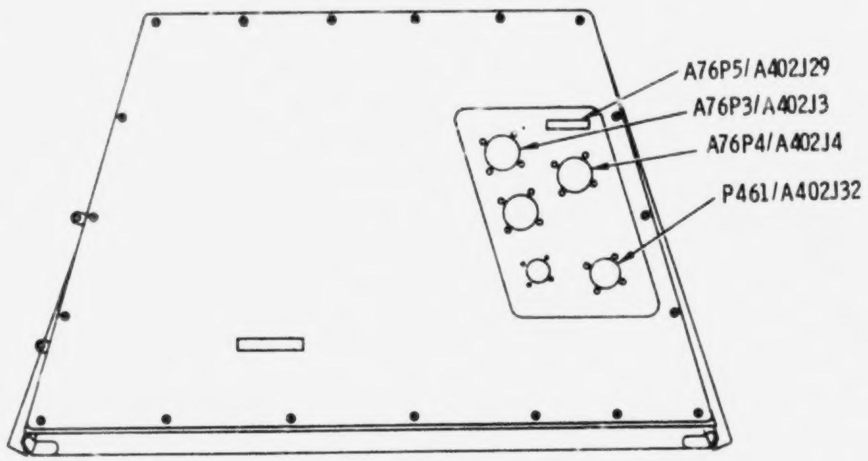
9-3-2. DC ELECTRICAL POWER GENERATION SYSTEM - INTERCONNECTION DIAGRAM (cont)


P/O ELECTRICAL POWER DISTRIBUTION BOX
A
B
AC ELECTRICAL POWER GENERATION
P1-2B
C
28 VDC IN
H 3 2
A B C
D E F
TB1-2
W2
1 H
CR2
P/O TB1-2
K
CR4
J4
P4
G
J
K
L
N
M
CB56-1
CB46-1
CIRCUIT PROTECTION PILOT ESSENTIAL BUS 2
CB61-1
CB68-1
CIRCUIT PROTECTION PILOT ESSENTIAL BUS 3
(NOTE 2)
CB71-1
CB6-1
CIRCUIT PROTECTION PILOT ESSENTIAL BUS 1
D
28 VDC OUT
28 VDC IN
K6-A2
BATTERY RELAY
BATTERY SYSTEM
TB1-1
BUS NO. 3 W3
K
1
K
SHEET 1
A
B
C
D
DC EMERGENCY BUS
J29
P5
1
2
3
CB52-1
CB58-1
CB37-1
CIRCUIT PROTECTION PILOT DC EMERGENCY BUS
J32
P461
J
H
G
K
P769-A
P769-J
CIRCUIT PROTECTION CPG ESSENTIAL BUS 3
(NOTE 2)
P769-C
CIRCUIT PROTECTION CPG EMERGENCY BUS
P763-D
CIRCUIT PROTECTION CPG ESSENTIAL BUS 1
CR3
E
28 VDC IN
H 3 2
A B C
D E F
TB1-3
W1
1 H
CR1
K
P/O TB1-3
AC ELECTRICAL POWER GENERATION
P7-2B
UTILITY POWER DISTRIBUTION CIRCUIT BREAKER BOX
CB7
A1
A2
35A
A3
GROUND SERVICE UTILITY CONNECTOR
J18
A
28 VDC IN
F
G
H
I
J
K
L
M
N
O
A402
MAIN DECK
P/O TRANSFORMER/RECTIFIER NO. 2
+28 VDC OUT
P12
J1
G
TEMP HI
ϕC
ϕB
ϕA
T
B
I
F
115/200 VAC, 3ϕ IN (NOTE 6)
D
AC GND
PS2
ABI
ABH
GS444
A
GS443
A
B A
GS400
GS431
A
GS410
B A
P/O TRANSFORMER/RECTIFIER NO. 1
+28 VDC OUT
P6
J1
D
AC GND
ϕC
ϕB
ϕA
T
B
I
F
115/200 VAC, 3ϕ IN (NOTE 6)
G
TEMP HI
PS1
SHEET 2 OF 2
MM04/1-748-2F

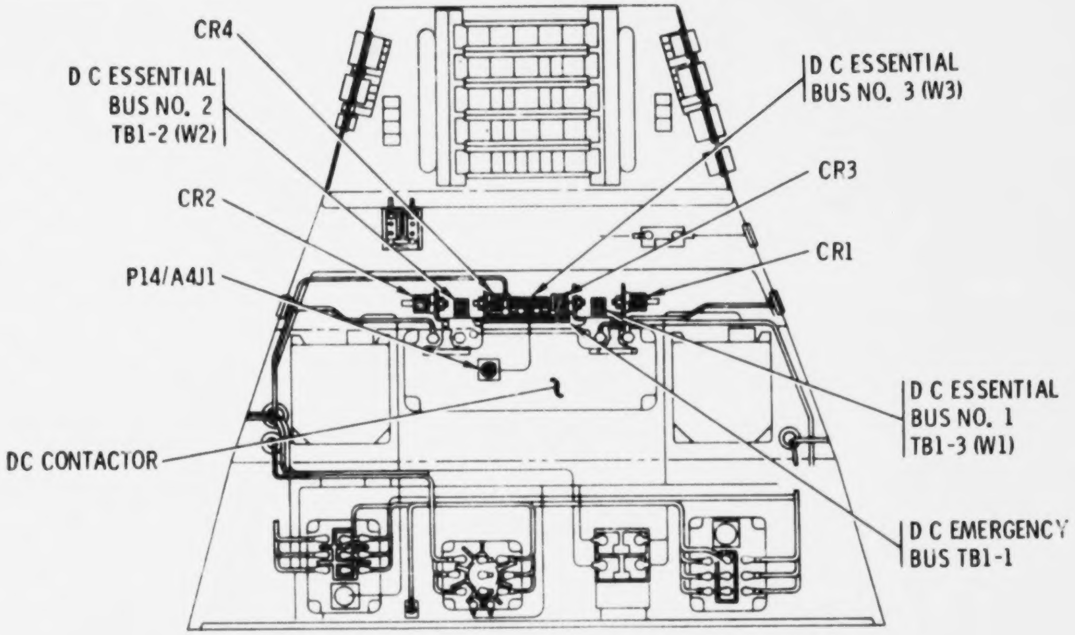
NOTES:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
2. ALL 28 VDC OUTPUTS.
3. OVER CURRENT DETECTOR.
4. VOLTAGE REGULATOR.
5. INDICATOR LIGHTS WITH GND INPUT.
6. GND OUT AT FAULT.
7. BOTH INPUT FAULTS MUST BE PRESENT TO TURN ON LIGHT.

9-3-3. DC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

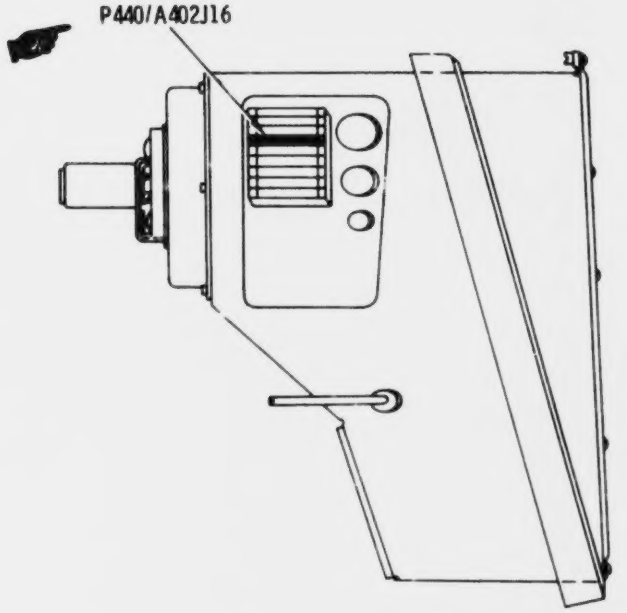


(WITH COVER INSTALLED)

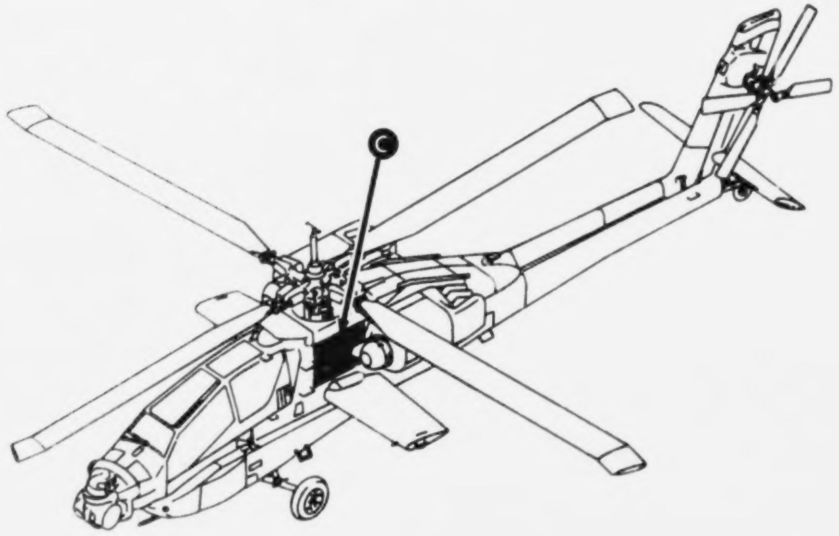

CR4
D C ESSENTIAL BUS NO. 2 TB1-2 (W2)
CR2
P14/A4J1
DC CONTACTOR
D C ESSENTIAL BUS NO. 3 (W3)
CR3
CR1
D C ESSENTIAL BUS NO. 1 TB1-3 (W1)
D C EMERGENCY BUS TB1-1

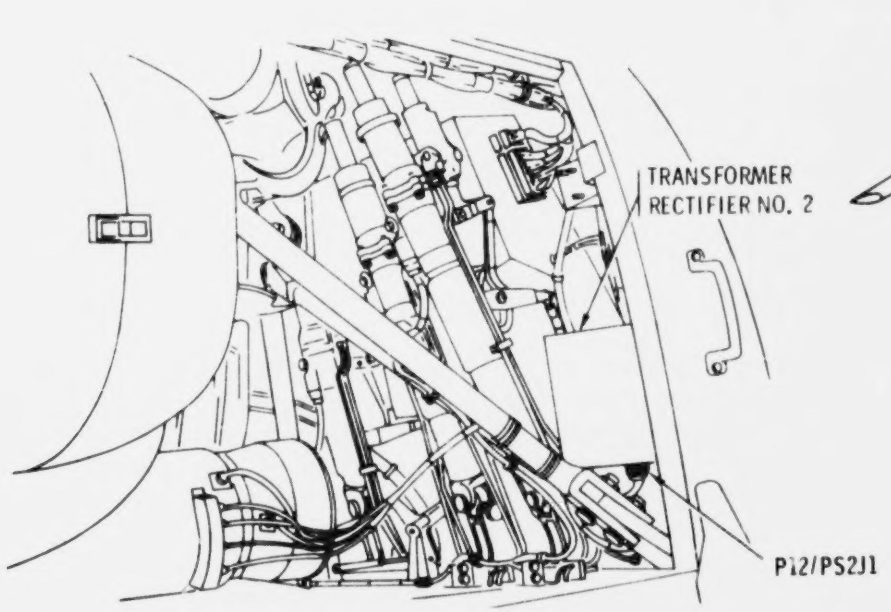
Ⓑ ELECTRICAL POWER DISTRIBUTION BOX

(WITH COVER REMOVED)

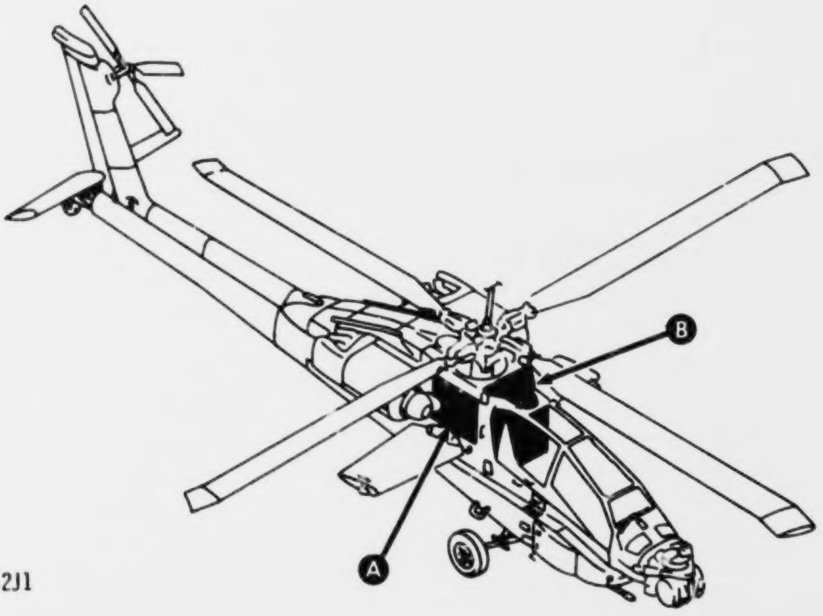


(RIGHT SIDE VIEW)



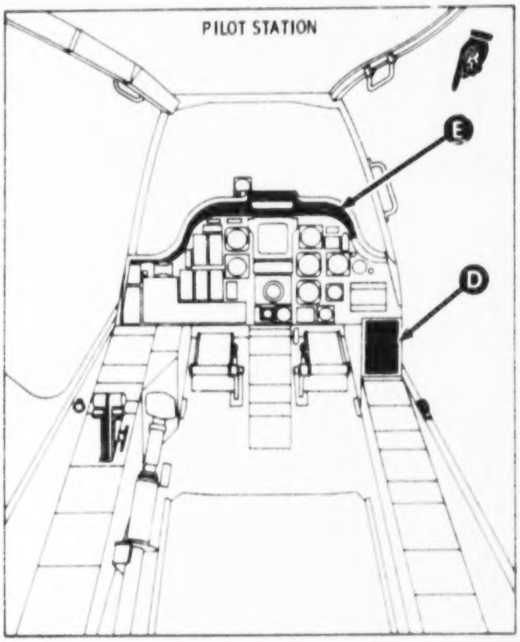


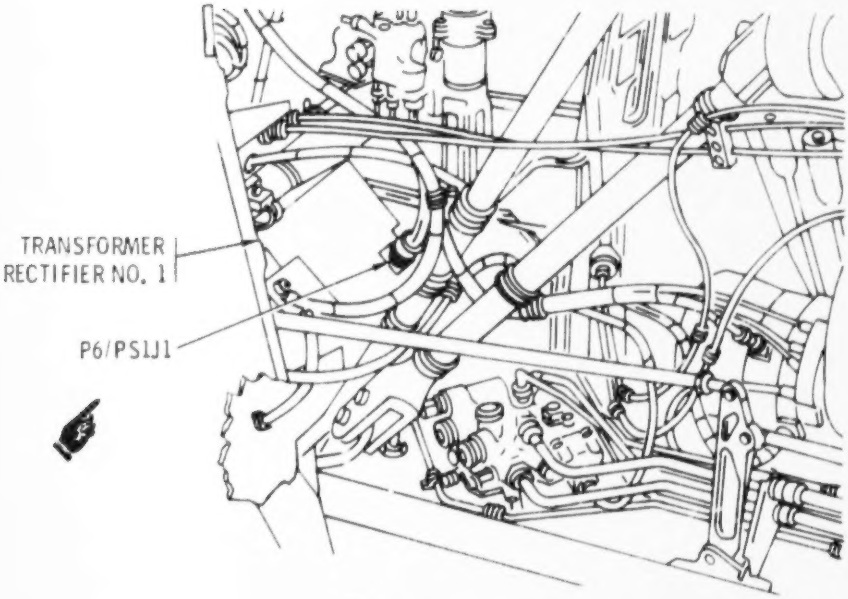
Ⓐ TRANSFORMER RECTIFIER NO. 2 THROUGH ACCESS PANEL R200



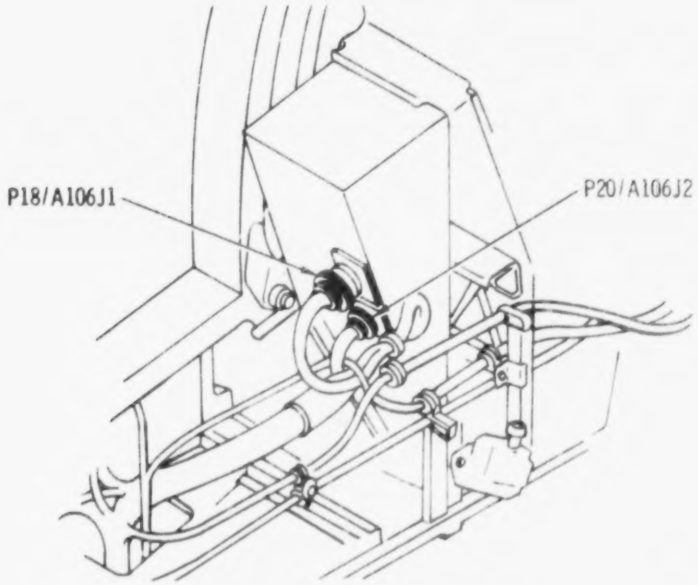
MM04/1-815-1D

9-3-3. DC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)





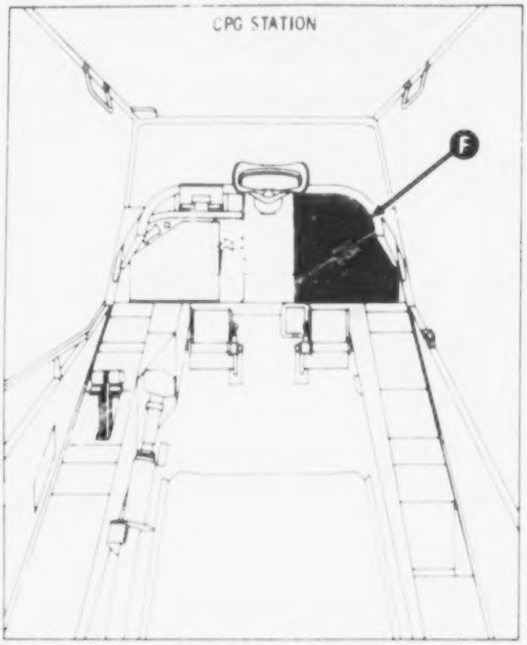
Ⓒ TRANSFORMER RECTIFIER NO. 1 THROUGH ACCESS PANEL L200

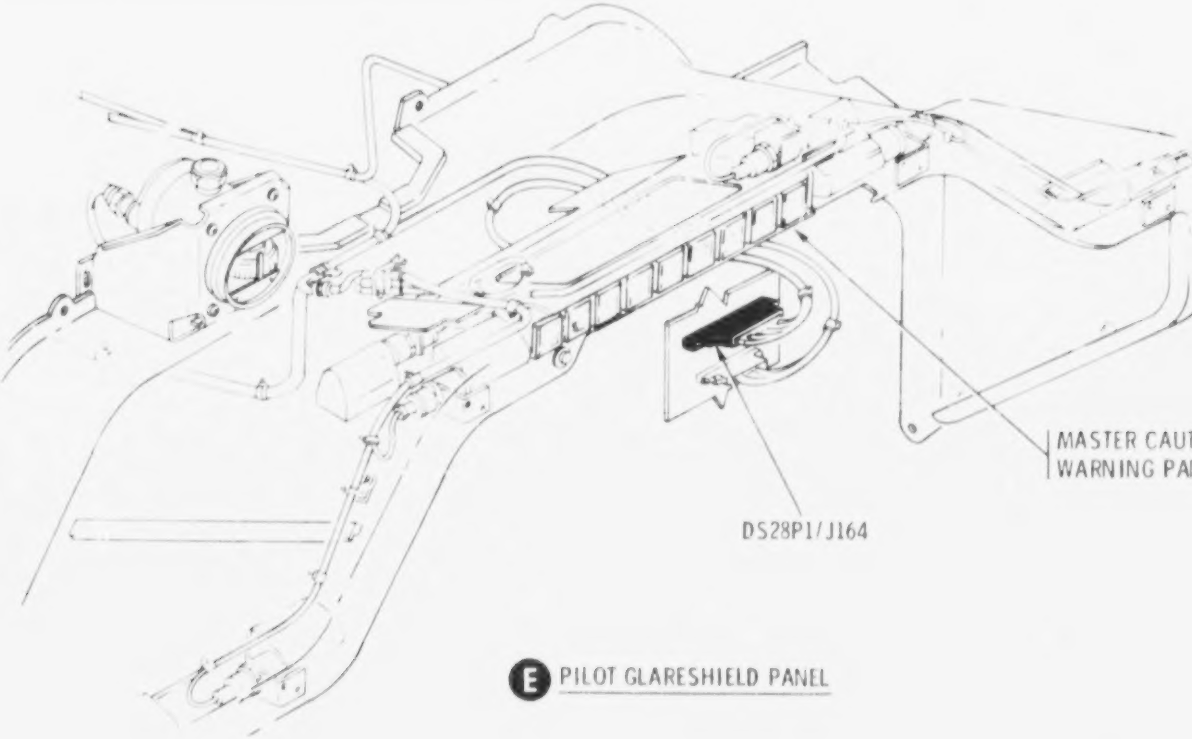


D PILOT RIGHT CONSOLE

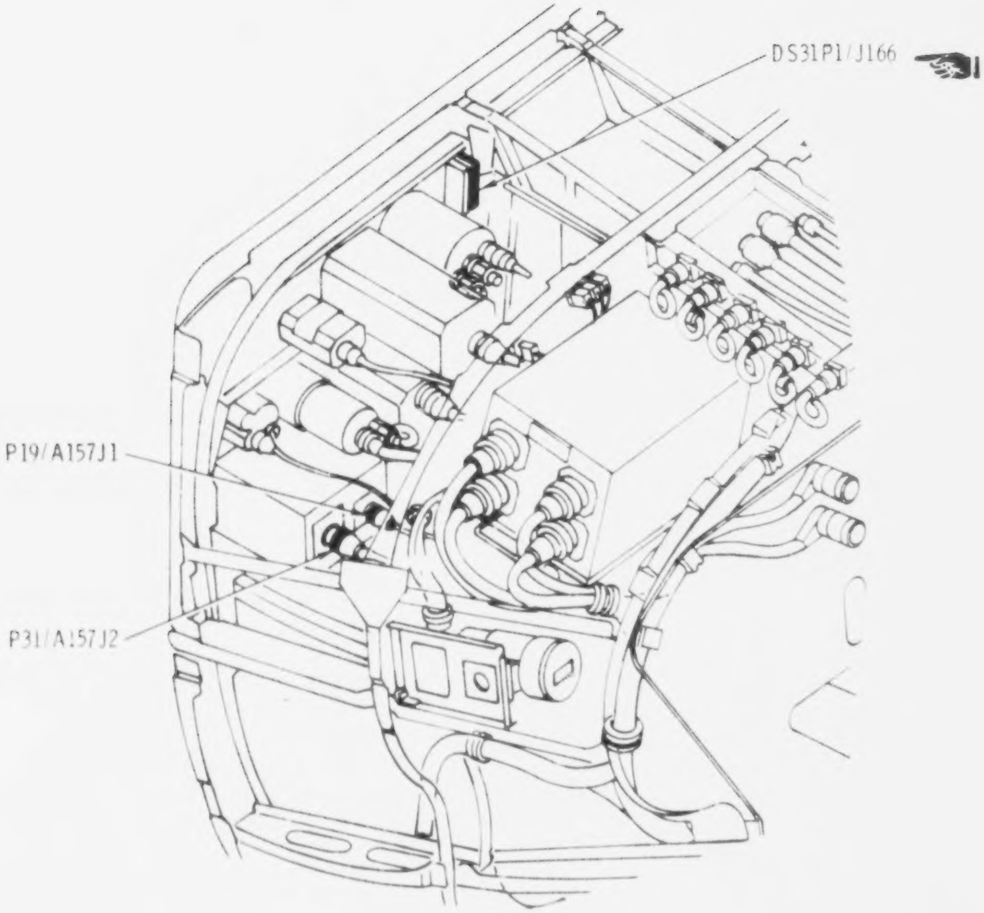
MM04/1-815-2D

9-3-3. DC ELECTRICAL POWER GENERATION - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)





E PILOT GLARESHIELD PANEL



Ⓕ CPG INSTRUMENT PANEL
(AFT VIEW)

ON/
L

9-3-4. POWER IS NOT AVAILABLE TO ALL DC ESSENTIAL BUS NO. 1 CIRCUIT BREAKERS

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

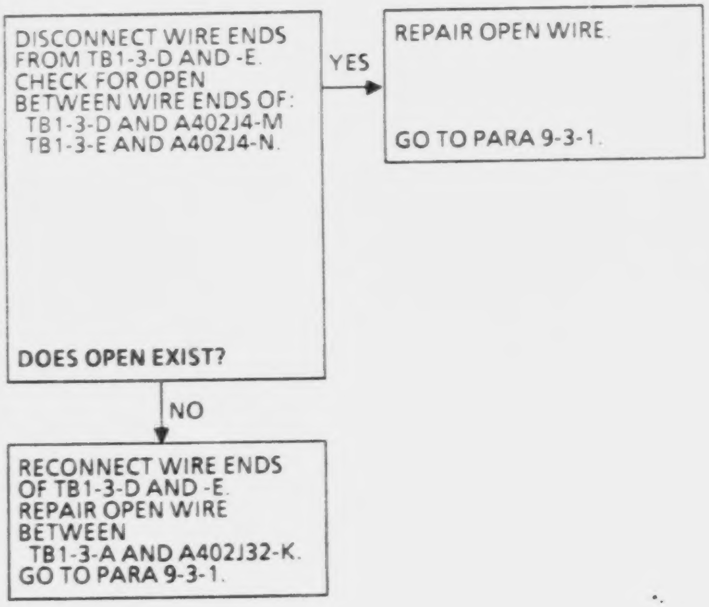
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power distribution box cover removed


DISCONNECT WIRE ENDS FROM TB1-3-D AND -E. CHECK FOR OPEN BETWEEN WIRE ENDS OF:
TB1-3-D AND A402J4-M
TB1-3-E AND A402J4-N.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-3-1.

RECONNECT WIRE ENDS OF TB1-3-D AND -E.
REPAIR OPEN WIRE BETWEEN
TB1-3-A AND A402J32-K.
GO TO PARA 9-3-1.

END OF TASK

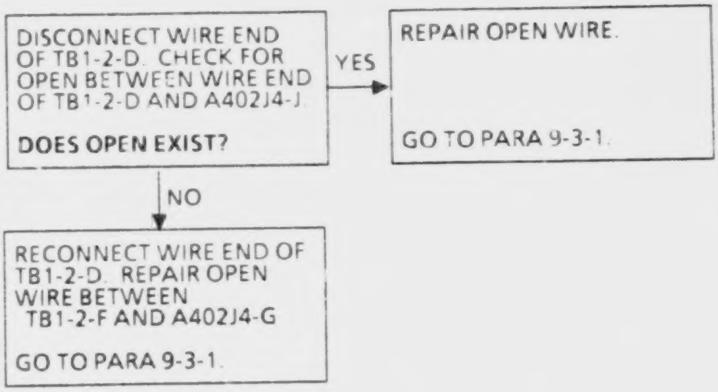
9-3-5. POWER IS NOT AVAILABLE TO ALL DC ESSENTIAL BUS NO. 2 CIRCUIT BREAKERS

Tools: (para 9-3-4)

Personnel Required: (para 9-3-4)

References: (para 9-3-4)

Equipment Conditions: (para 9-3-4)


DISCONNECT WIRE END OF TB1-2-D. CHECK FOR OPEN BETWEEN WIRE END OF TB1-2-D AND A402J4-J.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
RECONNECT WIRE END OF TB1-2-D. REPAIR OPEN WIRE BETWEEN TB1-2-F AND A402J4-G
GO TO PARA 9-3-1.

END OF TASK

9-3-6. POWER XFMR RECT 1 CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Tool Kit, Aircraft Mechanic's	5180-00-323-4692
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10	Aircraft Electrician
67R10	Attack Helicopter Repairer

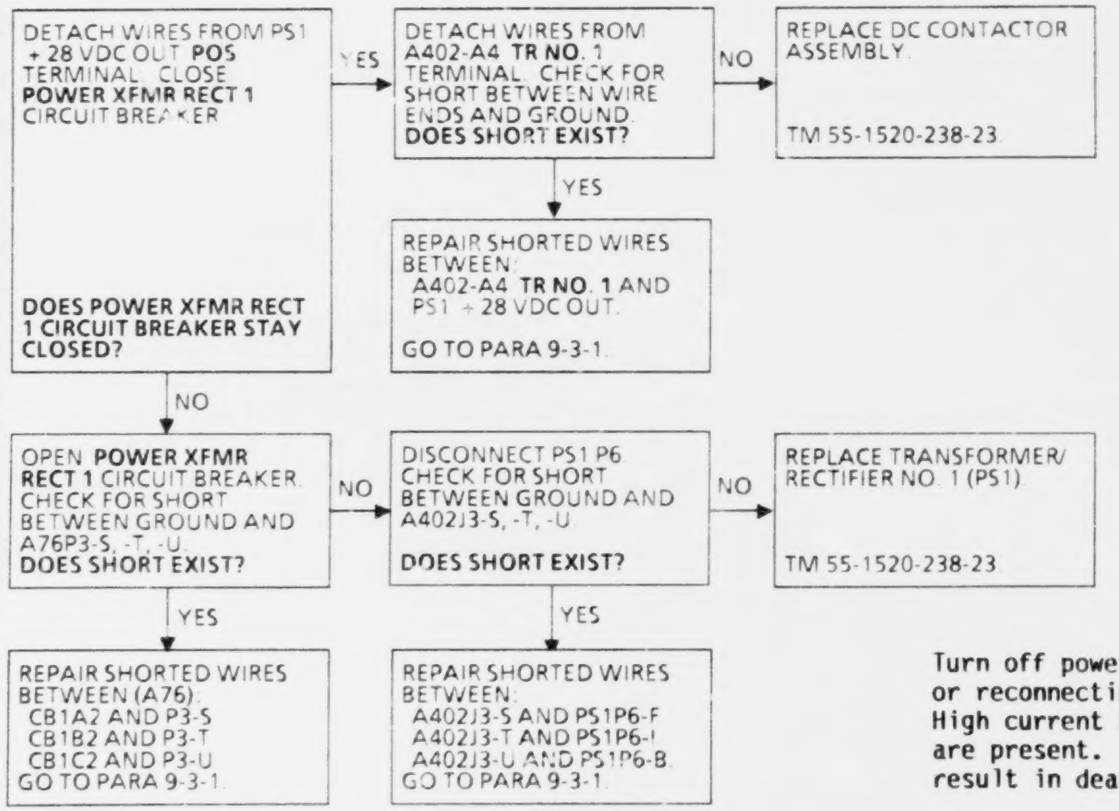
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions L200 panel - removed
	External power application - Electrical

REFER TO VOLTAGE WARNING


DETACH WIRES FROM PS1 + 28 VDC OUT **POS** TERMINAL. CLOSE **POWER XFMR RECT 1** CIRCUIT BREAKER.
DOES POWER XFMR RECT 1 CIRCUIT BREAKER STAY CLOSED?
YES
DETACH WIRES FROM A402-A4 **TR NO. 1** TERMINAL. CHECK FOR SHORT BETWEEN WIRE ENDS AND GROUND. **DOES SHORT EXIST?**
NO
REPLACE DC CONTACTOR ASSEMBLY.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRES BETWEEN: A402-A4 **TR NO. 1** AND PS1 + 28 VDC OUT.
GO TO PARA 9-3-1.
NO
OPEN **POWER XFMR RECT 1** CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76P3-S, -T, -U. **DOES SHORT EXIST?**
NO
DISCONNECT PS1 P6. CHECK FOR SHORT BETWEEN GROUND AND A402J3-S, -T, -U. **DOES SHORT EXIST?**
NO
REPLACE TRANSFORMER/ RECTIFIER NO. 1 (PS1).
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRES BETWEEN (A76): CB1A2 AND P3-S CB1B2 AND P3-T CB1C2 AND P3-U GO TO PARA 9-3-1.
YES
REPAIR SHORTED WIRES BETWEEN: A402J3-S AND PS1P6-F A402J3-T AND PS1P6-I A402J3-U AND PS1P6-B. GO TO PARA 9-3-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-3-7. POWER XFMR RECT 2 CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED

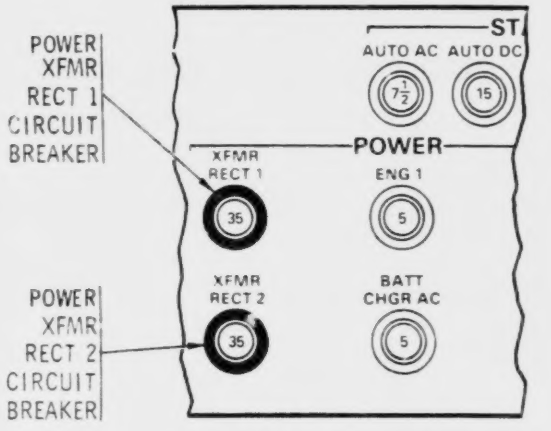
Tools: (para 9-3-6)

Personnel Required: (para 9-3-6)

References: (para 9-3-6)

Equipment Conditions:

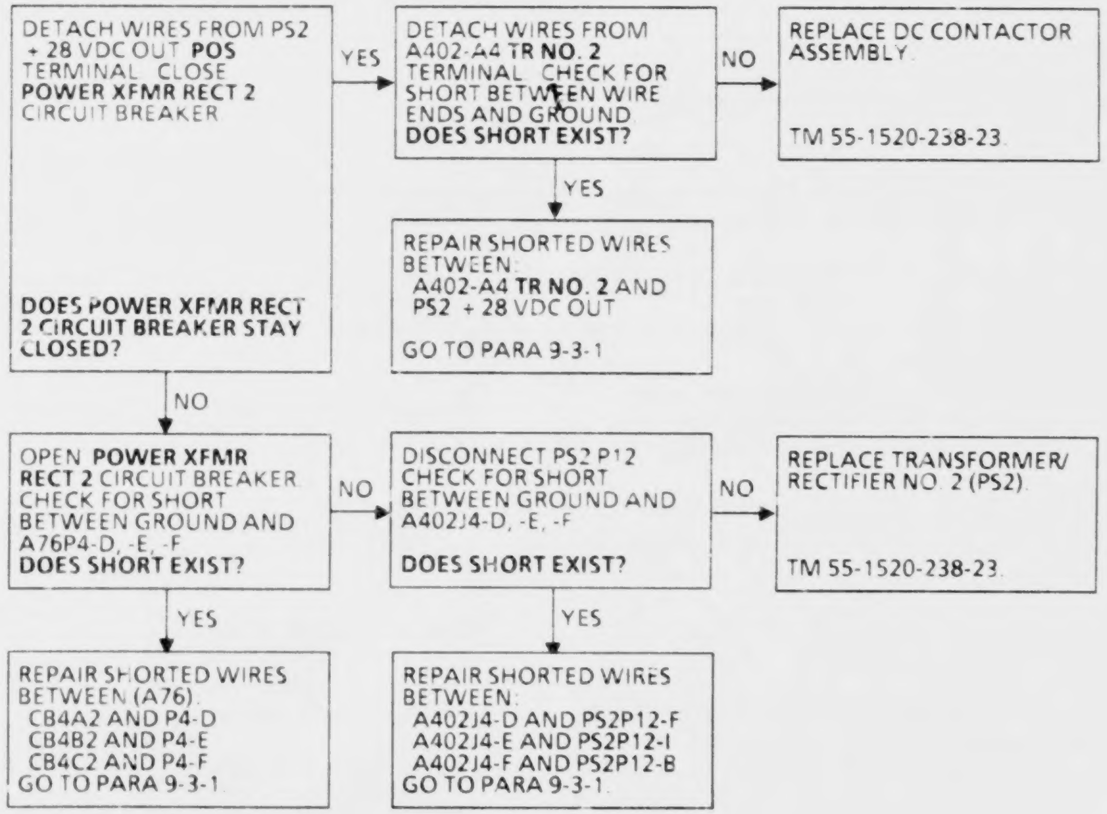
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions R200 panel - removed
	External power application - Electrical



PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-818A

REFER TO VOLTAGE WARNING


DETACH WIRES FROM PS2 + 28 VDC OUT **POS** TERMINAL. CLOSE **POWER XFMR RECT 2** CIRCUIT BREAKER.
DOES POWER XFMR RECT 2 CIRCUIT BREAKER STAY CLOSED?
YES
DETACH WIRES FROM A402-A4 **TR NO. 2** TERMINAL. CHECK FOR SHORT BETWEEN WIRE ENDS AND GROUND. **DOES SHORT EXIST?**
NO
REPLACE DC CONTACTOR ASSEMBLY.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRES BETWEEN: A402-A4 **TR NO. 2** AND PS2 + 28 VDC OUT
GO TO PARA 9-3-1
NO
OPEN **POWER XFMR RECT 2** CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76P4-D, -E, -F **DOES SHORT EXIST?**
NO
DISCONNECT PS2 P12 CHECK FOR SHORT BETWEEN GROUND AND A402J4-D, -E, -F **DOES SHORT EXIST?**
NO
REPLACE TRANSFORMER/ RECTIFIER NO. 2 (PS2).
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRES BETWEEN (A76): CB4A2 AND P4-D CB4B2 AND P4-E CB4C2 AND P4-F GO TO PARA 9-3-1.
YES
REPAIR SHORTED WIRES BETWEEN: A402J4-D AND PS2P12-F A402J4-E AND PS2P12-I A402J4-F AND PS2P12-B GO TO PARA 9-3-1.

END OF TASK

9-3-8. RECT 1 INDICATOR ON PILOT CAUTION/WARNING PANEL - LIGHTS

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

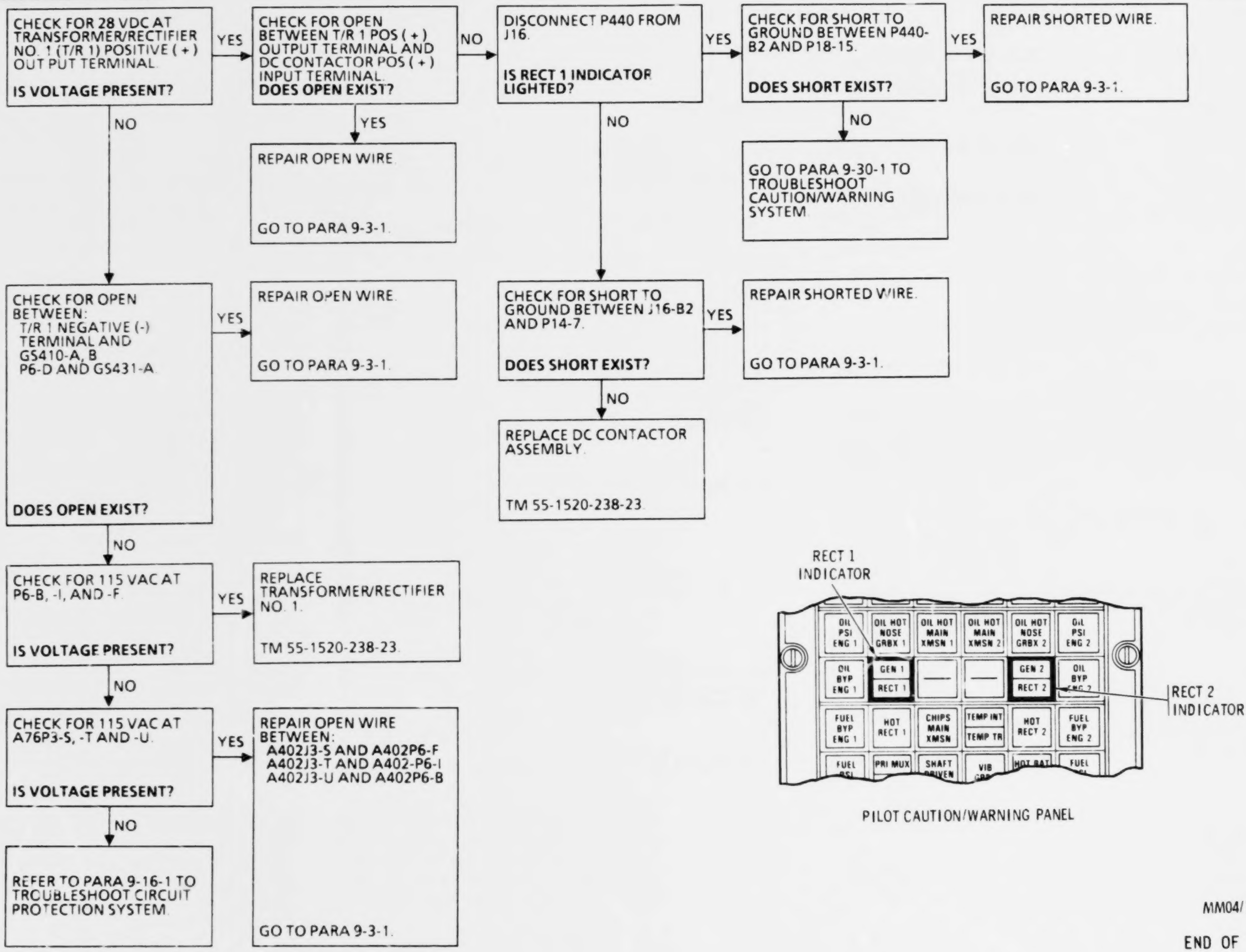
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Accessing provisions L200 panel - removed
	Electrical power distribution box cover removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT TRANSFORMER/RECTIFIER NO. 1 (T/R 1) POSITIVE (+) OUT PUT TERMINAL.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN T/R 1 POS (+) OUTPUT TERMINAL AND DC CONTACTOR POS (+) INPUT TERMINAL.
DOES OPEN EXIST?
NO
DISCONNECT P440 FROM J16.
IS RECT 1 INDICATOR LIGHTED?
YES
CHECK FOR SHORT TO GROUND BETWEEN P440-B2 AND P18-15.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-3-1.
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
NO
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.
CHECK FOR OPEN BETWEEN: T/R 1 NEGATIVE (-) TERMINAL AND GS410-A, B P6-D AND GS431-A.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
CHECK FOR SHORT TO GROUND BETWEEN J16-B2 AND P14-7.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-3-1.
NO
REPLACE DC CONTACTOR ASSEMBLY.
TM 55-1520-238-23.
NO
CHECK FOR 115 VAC AT P6-B, -I, AND -F.
IS VOLTAGE PRESENT?
YES
REPLACE TRANSFORMER/RECTIFIER NO. 1.
TM 55-1520-238-23.
NO
CHECK FOR 115 VAC AT A76P3-S, -T AND -U.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN: A402J3-S AND A402P6-F A402J3-T AND A402-P6-I A402J3-U AND A402P6-B
GO TO PARA 9-3-1.
NO
REFER TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

RECT 1 INDICATOR
OIL PSI ENG 1
OIL HOT NOSE GRBX 1
OIL HOT MAIN XMSN 1
OIL HOT MAIN XMSN 2
OIL HOT NOSE GRBX 2
OIL PSI ENG 2
OIL BYP ENG 1
GEN 1
RECT 1
GEN 2
RECT 2
OIL BYP ENG 2
RECT 2 INDICATOR
FUEL BYP ENG 1
HOT RECT 1
CHIPS MAIN XMSN
TEMP INT
TEMP TR
HOT RECT 2
FUEL BYP ENG 2
FUEL
PRI MUX
SHAFT DRIVEN
VIB
HOT BAT
FUEL

PILOT CAUTION/WARNING PANEL

MM04/1-1450

END OF TASK

9-3-9. RECT 2 INDICATOR ON PILOT CAUTION/WARNING PANEL - LIGHTS

9-3-9

Tools: (para 9-3-8)

Personnel Required: (para 9-3-8)

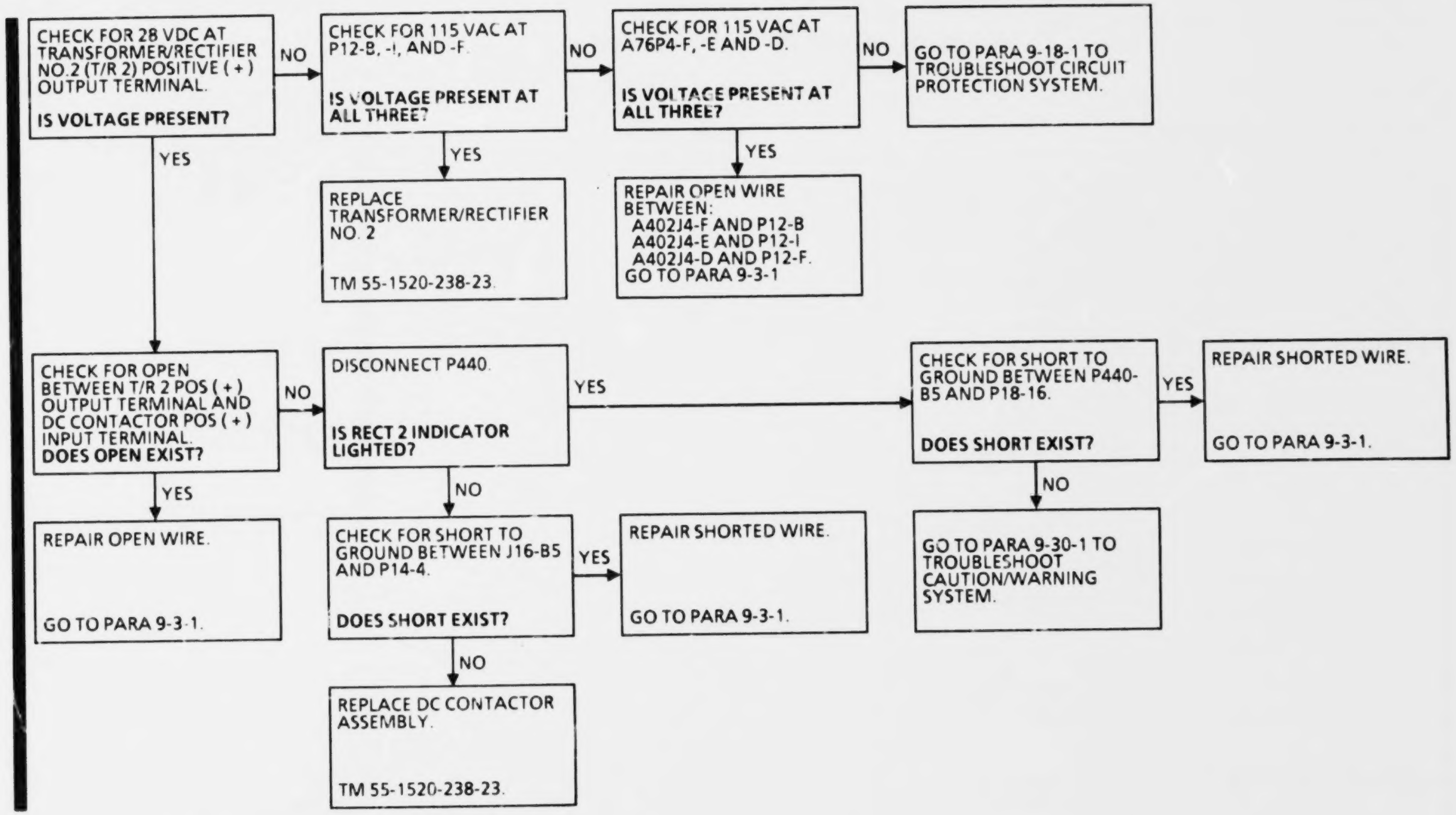
References: (para 9-3-8)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Access provisions R200 panel - removed
	Electrical power distribution box cover removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT TRANSFORMER/RECTIFIER NO.2 (T/R 2) POSITIVE (+) OUTPUT TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR 115 VAC AT P12-B, -I, AND -F.
IS VOLTAGE PRESENT AT ALL THREE?
NO
CHECK FOR 115 VAC AT A76P4-F, -E AND -D.
IS VOLTAGE PRESENT AT ALL THREE?
NO
GO TO PARA 9-18-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
REPLACE TRANSFORMER/RECTIFIER NO. 2
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE BETWEEN:
A402J4-F AND P12-B
A402J4-E AND P12-I
A402J4-D AND P12-F.
GO TO PARA 9-3-1
YES
CHECK FOR OPEN BETWEEN T/R 2 POS (+) OUTPUT TERMINAL AND DC CONTACTOR POS (+) INPUT TERMINAL.
DOES OPEN EXIST?
NO
DISCONNECT P440.
IS RECT 2 INDICATOR LIGHTED?
YES
CHECK FOR SHORT TO GROUND BETWEEN P440-B5 AND P18-16.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-3-1.
NO
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
CHECK FOR SHORT TO GROUND BETWEEN J16-B5 AND P14-4.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-3-1.
NO
REPLACE DC CONTACTOR ASSEMBLY.
TM 55-1520-238-23.

END OF TASK

9-3-10. POWER XFMR RECT 1 AND POWER XFMR RECT 2 CIRCUIT BREAKERS - DO NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

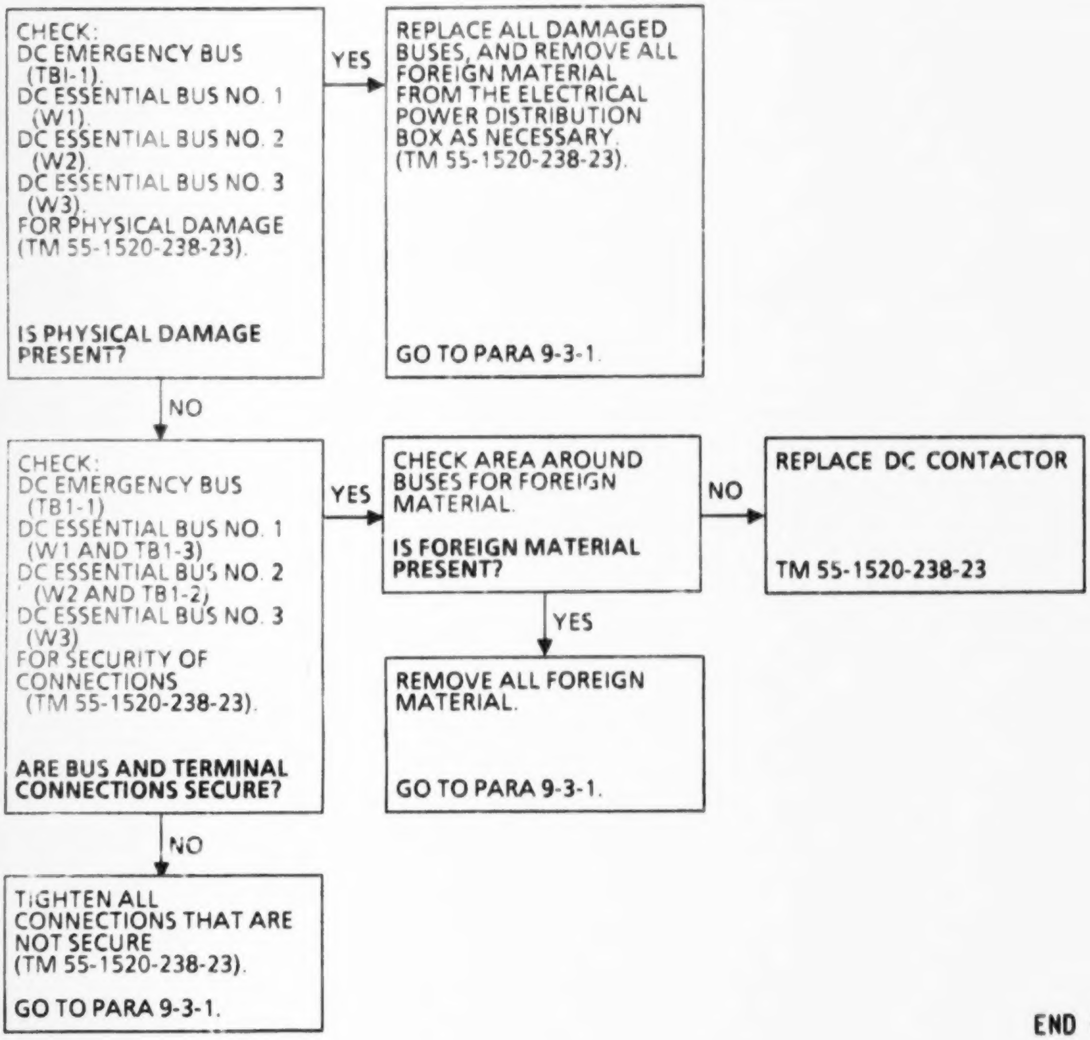
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Electrical power distribution box cover removed


CHECK: DC EMERGENCY BUS (TBI-1). DC ESSENTIAL BUS NO. 1 (W1). DC ESSENTIAL BUS NO. 2 (W2). DC ESSENTIAL BUS NO. 3 (W3). FOR PHYSICAL DAMAGE (TM 55-1520-238-23).
IS PHYSICAL DAMAGE PRESENT?
YES
REPLACE ALL DAMAGED BUSES, AND REMOVE ALL FOREIGN MATERIAL FROM THE ELECTRICAL POWER DISTRIBUTION BOX AS NECESSARY. (TM 55-1520-238-23).
GO TO PARA 9-3-1.
NO
CHECK: DC EMERGENCY BUS (TB1-1) DC ESSENTIAL BUS NO. 1 (W1 AND TB1-3) DC ESSENTIAL BUS NO. 2 (W2 AND TB1-2) DC ESSENTIAL BUS NO. 3 (W3) FOR SECURITY OF CONNECTIONS (TM 55-1520-238-23).
ARE BUS AND TERMINAL CONNECTIONS SECURE?
YES
CHECK AREA AROUND BUSES FOR FOREIGN MATERIAL.
IS FOREIGN MATERIAL PRESENT?
NO
REPLACE DC CONTACTOR
TM 55-1520-238-23
YES
REMOVE ALL FOREIGN MATERIAL.
GO TO PARA 9-3-1.
NO
TIGHTEN ALL CONNECTIONS THAT ARE NOT SECURE (TM 55-1520-238-23).
GO TO PARA 9-3-1.

END OF TASK

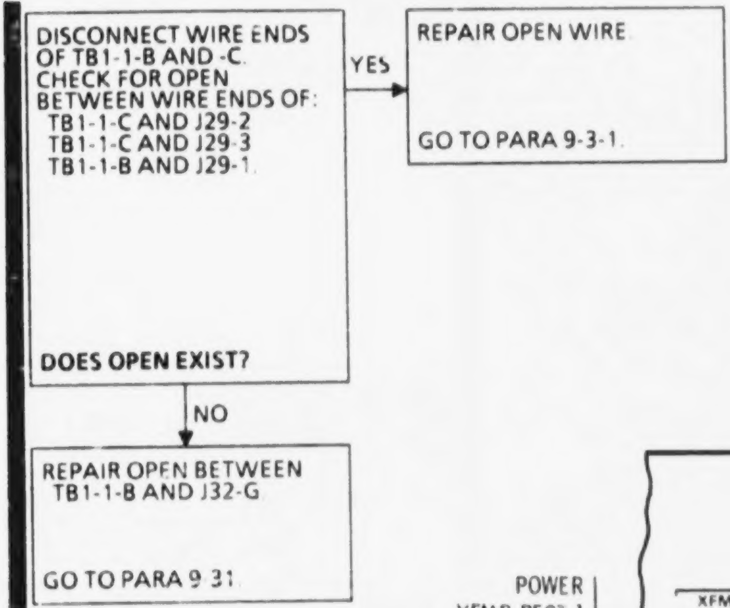
9-3-11. POWER IS NOT AVAILABLE TO ALL DC EMERGENCY BUS CIRCUIT BREAKERS

Tools: (para 9-3-10)

Personnel Required: (para 9-3-10)

References: (para 9-3-10)

Equipment Conditions: (para 9-3-10)

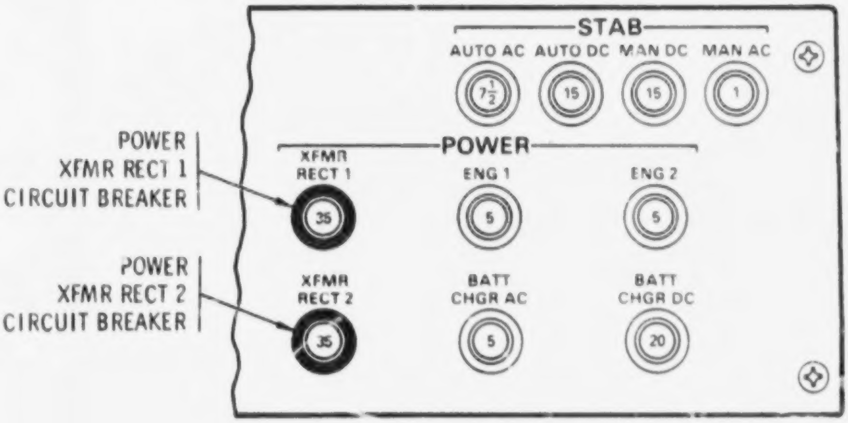


DISCONNECT WIRE ENDS OF TB1-1-B AND -C. CHECK FOR OPEN BETWEEN WIRE ENDS OF:
TB1-1-C AND J29-2
TB1-1-C AND J29-3
TB1-1-B AND J29-1.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-3-1.

NO: REPAIR OPEN BETWEEN TB1-1-B AND J32-G. GO TO PARA 9-3-1.



PILOT CIRCUIT BREAKER PANEL

NOTE:

LOCATION OF D.C. BUSES AND TERMINAL BOARDS ARE LOCATED IN PARA 9-3-3

MM04/1-1420

END OF TASK

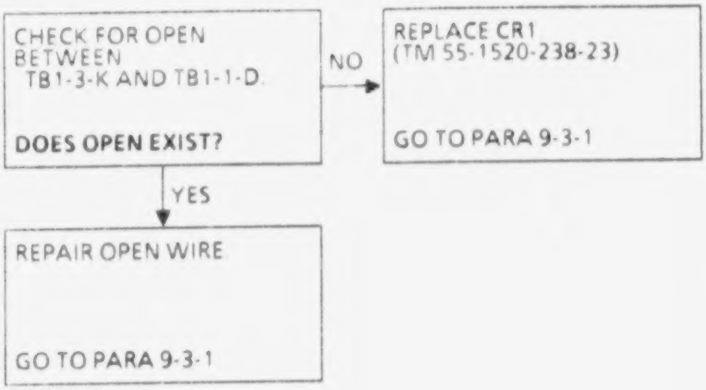
9-3-12. NO CONTINUITY BETWEEN W1 AND TB1-1-D

Tools: (para 9-3-10)

Personnel Required: (para 9-3-10)

References: (para 9-3-10)

Equipment Conditions: (para 9-3-10)


CHECK FOR OPEN BETWEEN TB1-3-K AND TB1-1-D.
DOES OPEN EXIST?
NO
REPLACE CR1 (TM 55-1520-238-23)
GO TO PARA 9-3-1
YES
REPAIR OPEN WIRE
GO TO PARA 9-3-1

END OF TASK

9-3-13. DC ESSENTIAL BUS NO. 1 - HAS NO POWER

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

References:

TM 55-1520-238-23

Equipment Conditions:

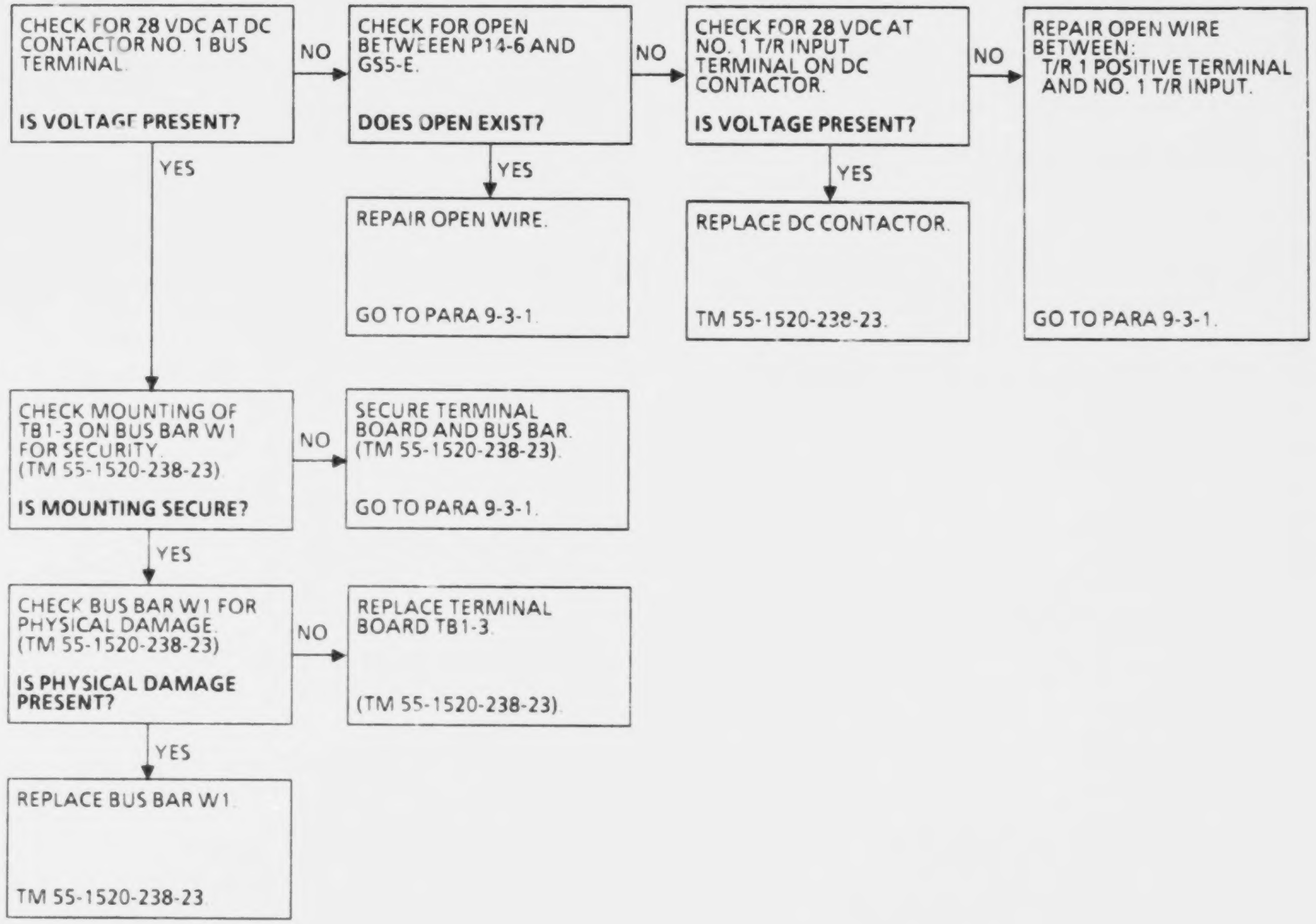
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Electrical power distribution box cover removed
Para 1-3-2	ICS connected

Personnel Required:

68F10 Aircraft Electrician
One person to assist

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 1 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEEN P14-6 AND G55-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R INPUT TERMINAL ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN: T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT.
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
YES
CHECK MOUNTING OF TB1-3 ON BUS BAR W1 FOR SECURITY. (TM 55-1520-238-23).
IS MOUNTING SECURE?
NO
SECURE TERMINAL BOARD AND BUS BAR. (TM 55-1520-238-23).
GO TO PARA 9-3-1.
YES
CHECK BUS BAR W1 FOR PHYSICAL DAMAGE. (TM 55-1520-238-23)
IS PHYSICAL DAMAGE PRESENT?
NO
REPLACE TERMINAL BOARD TB1-3.
(TM 55-1520-238-23).
YES
REPLACE BUS BAR W1.
TM 55-1520-238-23

END OF TASK

9-3-14. DC ESSENTIAL BUS NO. 2 - HAS NO POWER

Tools: (para 9-3-13)

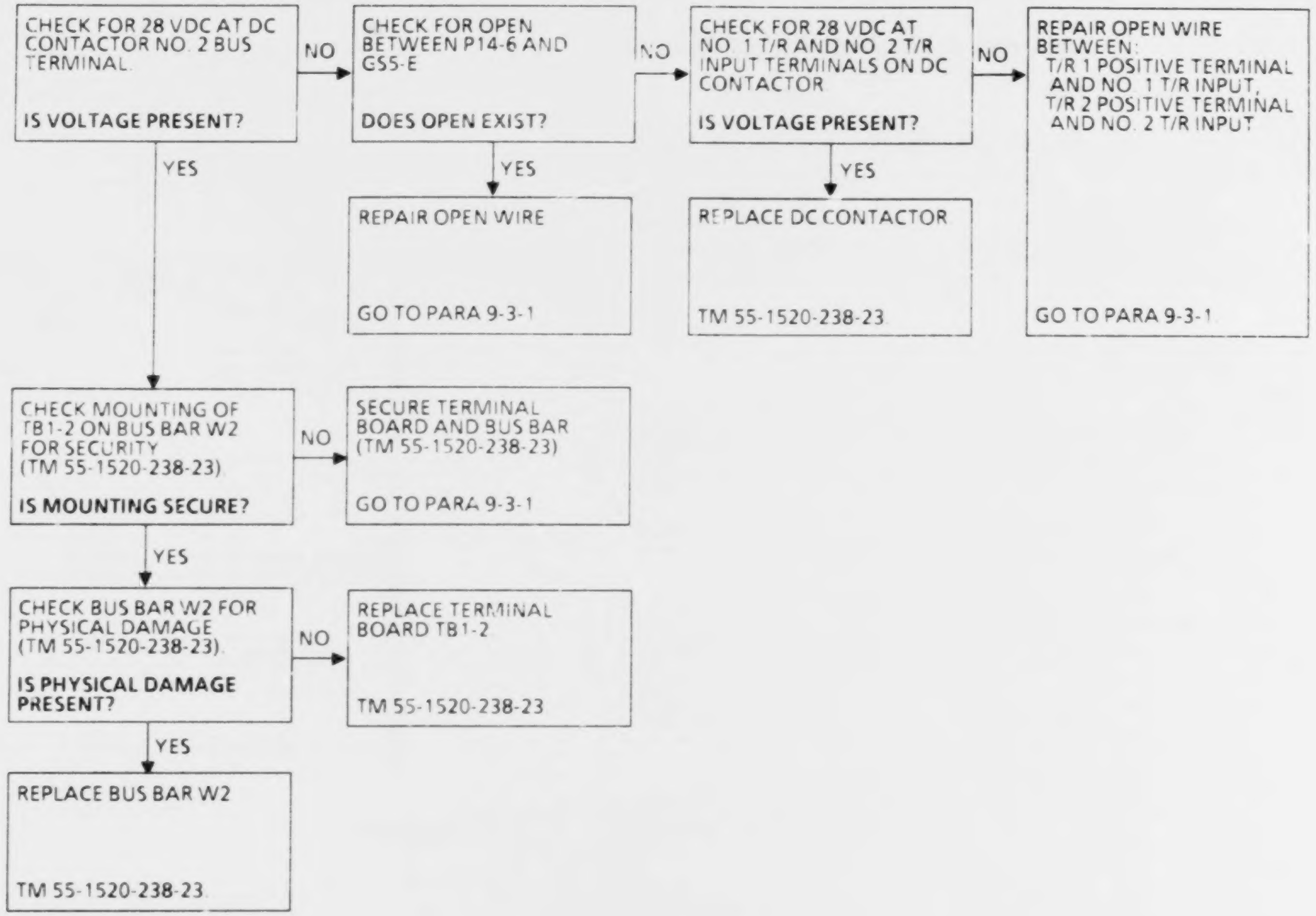
Personnel Required: (para 9-3-13)

References: (para 9-3-13)

Equipment Conditions: (para 9-3-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 2 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS ON DC CONTACTOR
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN:
T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT,
T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT
GO TO PARA 9-3-1
YES
YES
REPAIR OPEN WIRE
GO TO PARA 9-3-1
YES
REPLACE DC CONTACTOR
TM 55-1520-238-23
CHECK MOUNTING OF TB1-2 ON BUS BAR W2 FOR SECURITY (TM 55-1520-238-23)
IS MOUNTING SECURE?
NO
SECURE TERMINAL BOARD AND BUS BAR (TM 55-1520-238-23)
GO TO PARA 9-3-1
YES
CHECK BUS BAR W2 FOR PHYSICAL DAMAGE (TM 55-1520-238-23)
IS PHYSICAL DAMAGE PRESENT?
NO
REPLACE TERMINAL BOARD TB1-2
TM 55-1520-238-23
YES
REPLACE BUS BAR W2
TM 55-1520-238-23

END OF TASK

9-3-15. NO CONTINUITY BETWEEN W2 AND TB1-1-D

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

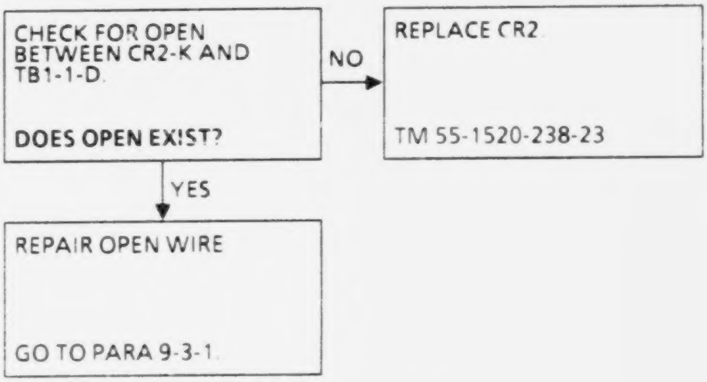
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Electrical power distribution box cover removed



END OF TASK

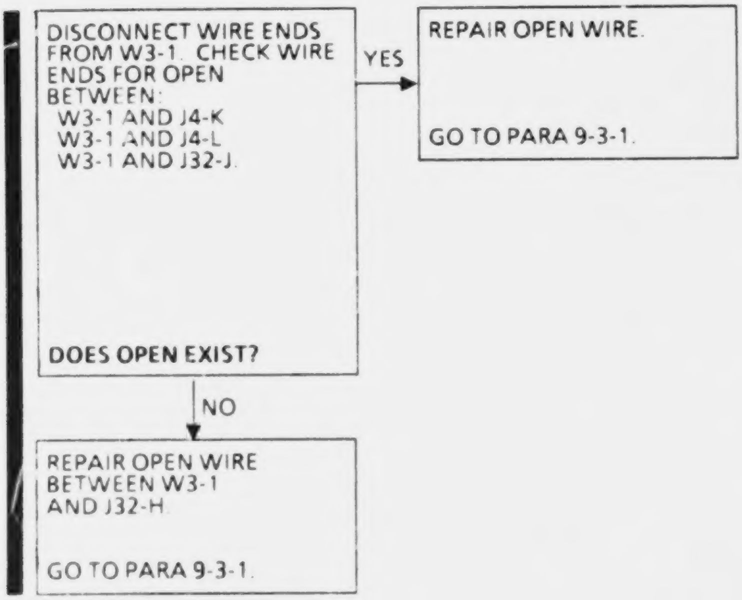
9-3-16. POWER IS NOT AVAILABLE TO ALL DC ESSENTIAL BUS NO. 3 CIRCUIT BREAKERS

Tools: (para 9-3-15)

Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-15)



END OF TASK

9-3-17. HOT RECT 1 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

Personnel Required: (para 9-3-15)

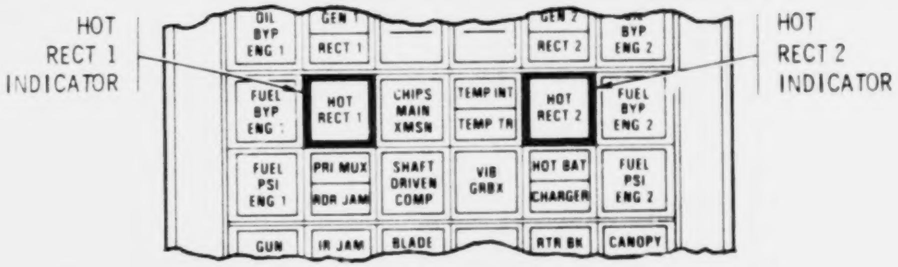
References: (para 9-3-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

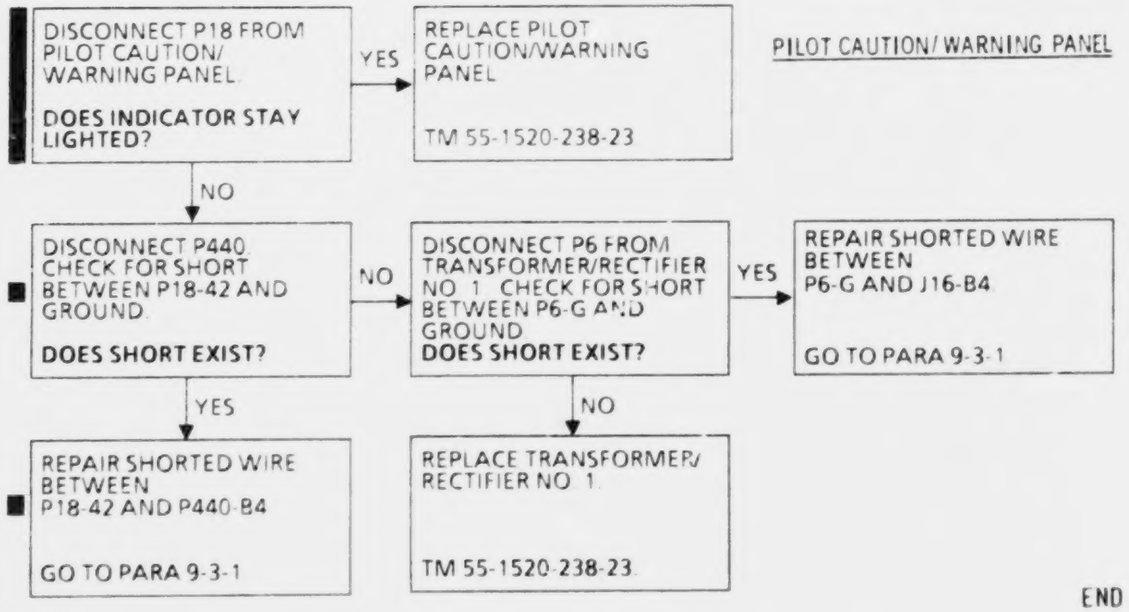
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CAUTION/ WARNING PANEL

MM04/1-829A


DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL.
DOES INDICATOR STAY LIGHTED?
YES
REPLACE PILOT CAUTION/WARNING PANEL
TM 55-1520-238-23
NO
DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-42 AND GROUND.
DOES SHORT EXIST?
NO
DISCONNECT P6 FROM TRANSFORMER/RECTIFIER NO. 1. CHECK FOR SHORT BETWEEN P6-G AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P6-G AND J16-B4
GO TO PARA 9-3-1
YES
REPAIR SHORTED WIRE BETWEEN P18-42 AND P440-B4
GO TO PARA 9-3-1
NO
REPLACE TRANSFORMER/ RECTIFIER NO. 1.
TM 55-1520-238-23.

END OF TASK

9-3-18. HOT RECT 2 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

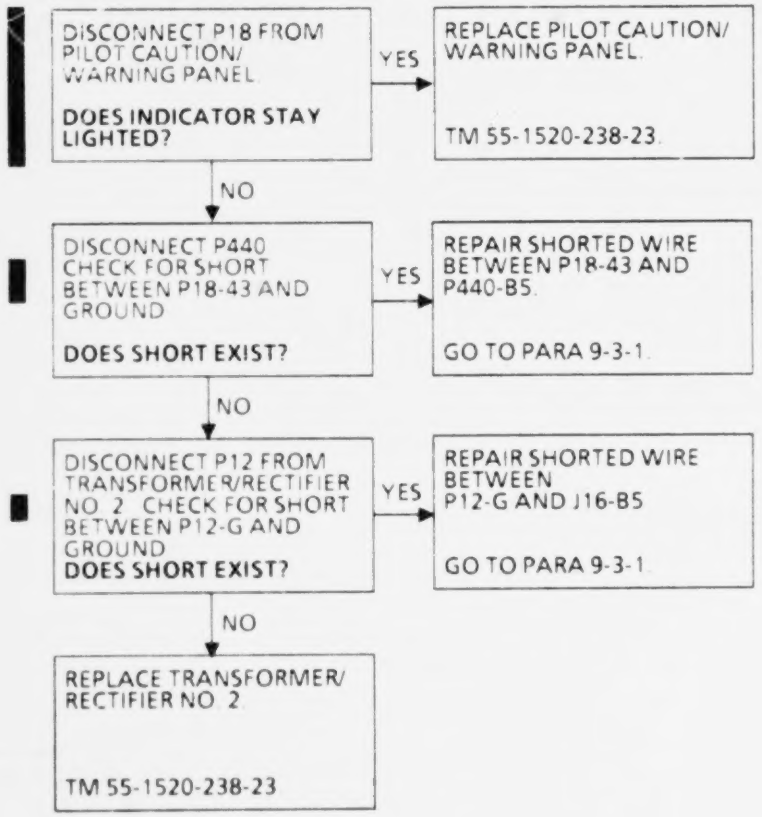
Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-17)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL.
DOES INDICATOR STAY LIGHTED?
YES
REPLACE PILOT CAUTION/ WARNING PANEL.
TM 55-1520-238-23.
NO
DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-43 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P18-43 AND P440-B5.
GO TO PARA 9-3-1.
NO
DISCONNECT P12 FROM TRANSFORMER/RECTIFIER NO. 2. CHECK FOR SHORT BETWEEN P12-G AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P12-G AND J16-B5
GO TO PARA 9-3-1.
NO
REPLACE TRANSFORMER/ RECTIFIER NO. 2.
TM 55-1520-238-23

END OF TASK

9-3-19. RECT 1 INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

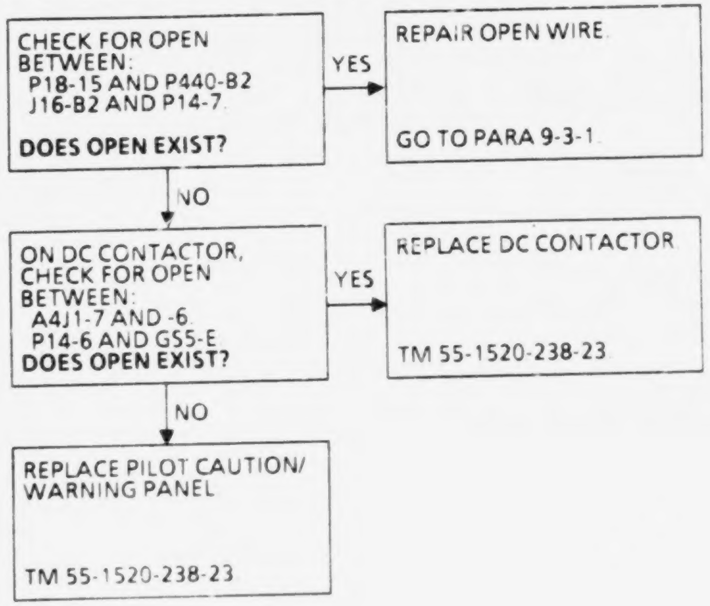
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power distribution box cover removed.



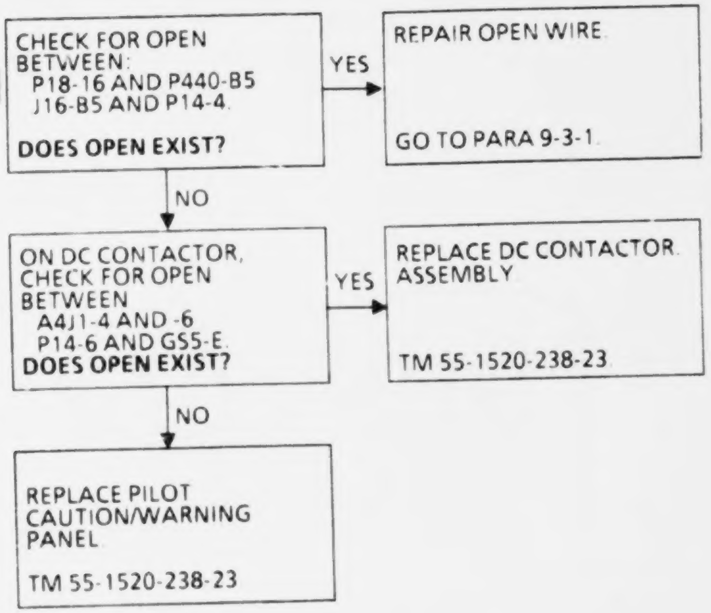
9-3-20. RECT 2 INDICATOR - IS NOT LIGHTED

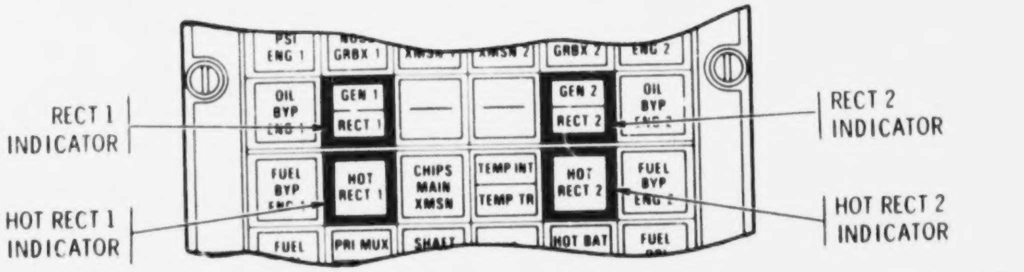
Tools: (para 9-3-19)

Personnel Required: (para 9-3-19)

References: (para 9-3-19)

Equipment Conditions: (para 9-3-19)





PILOT CAUTION / WARNING PANEL

END OF TASK

END OF TASK

(All data on Pages 9-55 thru 9-61 deleted)

9-3-12. EMERGENCY POWER DISTRIBUTION TERMINAL BOARD - HAS NO POWER

Tools: (para 9-3-10)

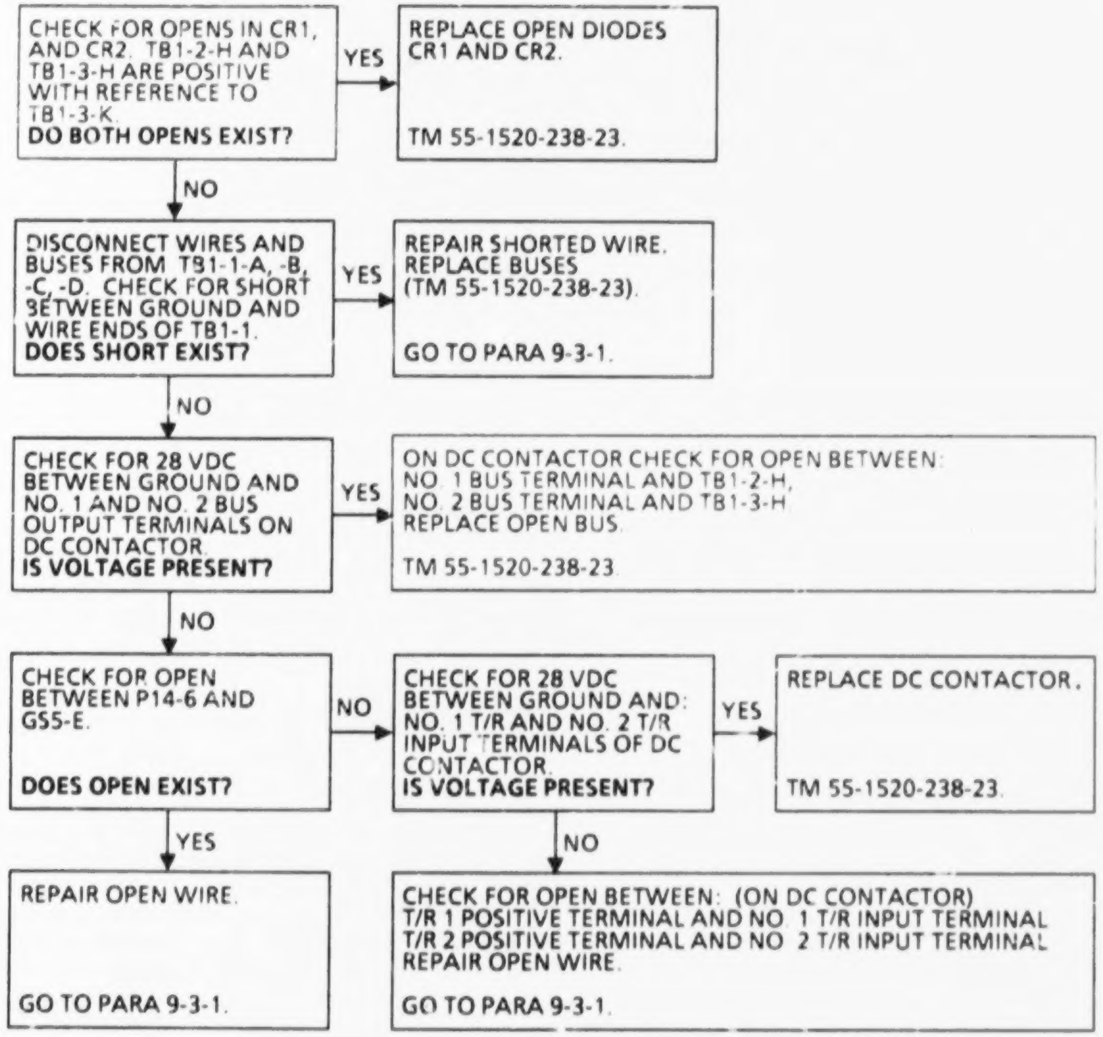
Personnel Required: (para 9-3-10)

References: (para 9-3-10)

Equipment Conditions: (para 9-3-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPENS IN CR1, AND CR2. TB1-2-H AND TB1-3-H ARE POSITIVE WITH REFERENCE TO TB1-3-K.
DO BOTH OPENS EXIST?
YES
REPLACE OPEN DIODES CR1 AND CR2.
TM 55-1520-238-23.
NO
DISCONNECT WIRES AND BUSES FROM TB1-1-A, -B, -C, -D. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS OF TB1-1.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. REPLACE BUSES (TM 55-1520-238-23).
GO TO PARA 9-3-1.
NO
CHECK FOR 28 VDC BETWEEN GROUND AND NO. 1 AND NO. 2 BUS OUTPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
YES
ON DC CONTACTOR CHECK FOR OPEN BETWEEN: NO. 1 BUS TERMINAL AND TB1-2-H, NO. 2 BUS TERMINAL AND TB1-3-H. REPLACE OPEN BUS.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC BETWEEN GROUND AND NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS OF DC CONTACTOR.
IS VOLTAGE PRESENT?
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
CHECK FOR OPEN BETWEEN: (ON DC CONTACTOR) T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT TERMINAL T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT TERMINAL REPAIR OPEN WIRE.
GO TO PARA 9-3-1.

END OF TASK

9-3-13. DC ESSENTIAL BUS NO. 1 (PILOT STATION) - HAS NO POWER

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Electrical power center cover removed
Para 1-3-2	ICS connected

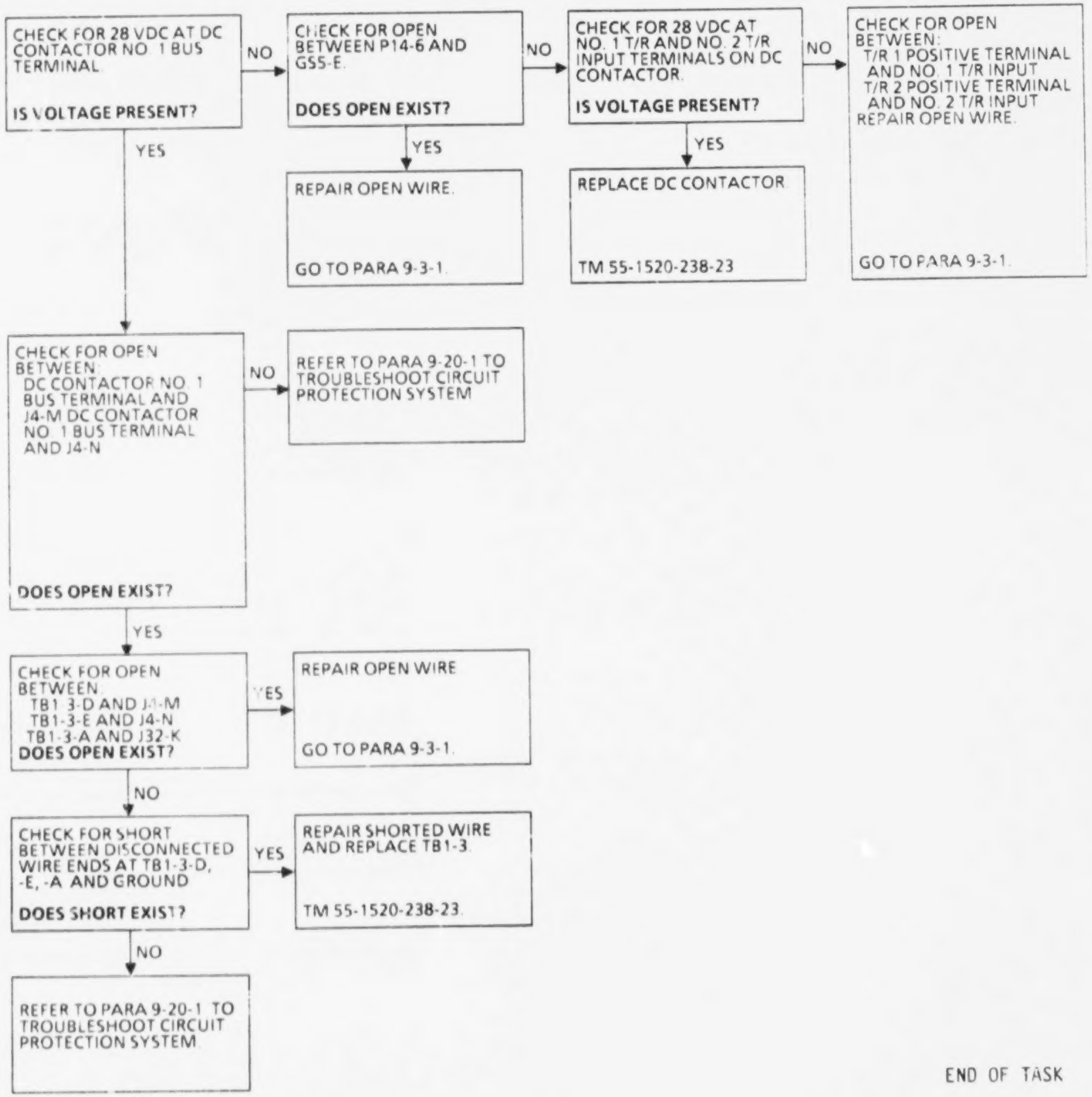
Personnel Required:

68F10 Aircraft Electrician
One person to assist

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

9-3-13


CHECK FOR 28 VDC AT DC CONTACTOR NO. 1 BUS TERMINAL
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR
TM 55-1520-238-23
YES
CHECK FOR OPEN BETWEEN: DC CONTACTOR NO. 1 BUS TERMINAL AND J4-M DC CONTACTOR NO. 1 BUS TERMINAL AND J4-N
DOES OPEN EXIST?
NO
REFER TO PARA 9-20-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM
YES
CHECK FOR OPEN BETWEEN TB1-3-D AND J4-M TB1-3-E AND J4-N TB1-3-A AND J32-K
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-3-1.
NO
CHECK FOR SHORT BETWEEN DISCONNECTED WIRE ENDS AT TB1-3-D, -E, -A AND GROUND
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE AND REPLACE TB1-3.
TM 55-1520-238-23.
NO
REFER TO PARA 9-20-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-3-14. DC ESSENTIAL BUS NO. 2 (PILOT STATION) - HAS NO POWER

Tools: (para 9-3-13)

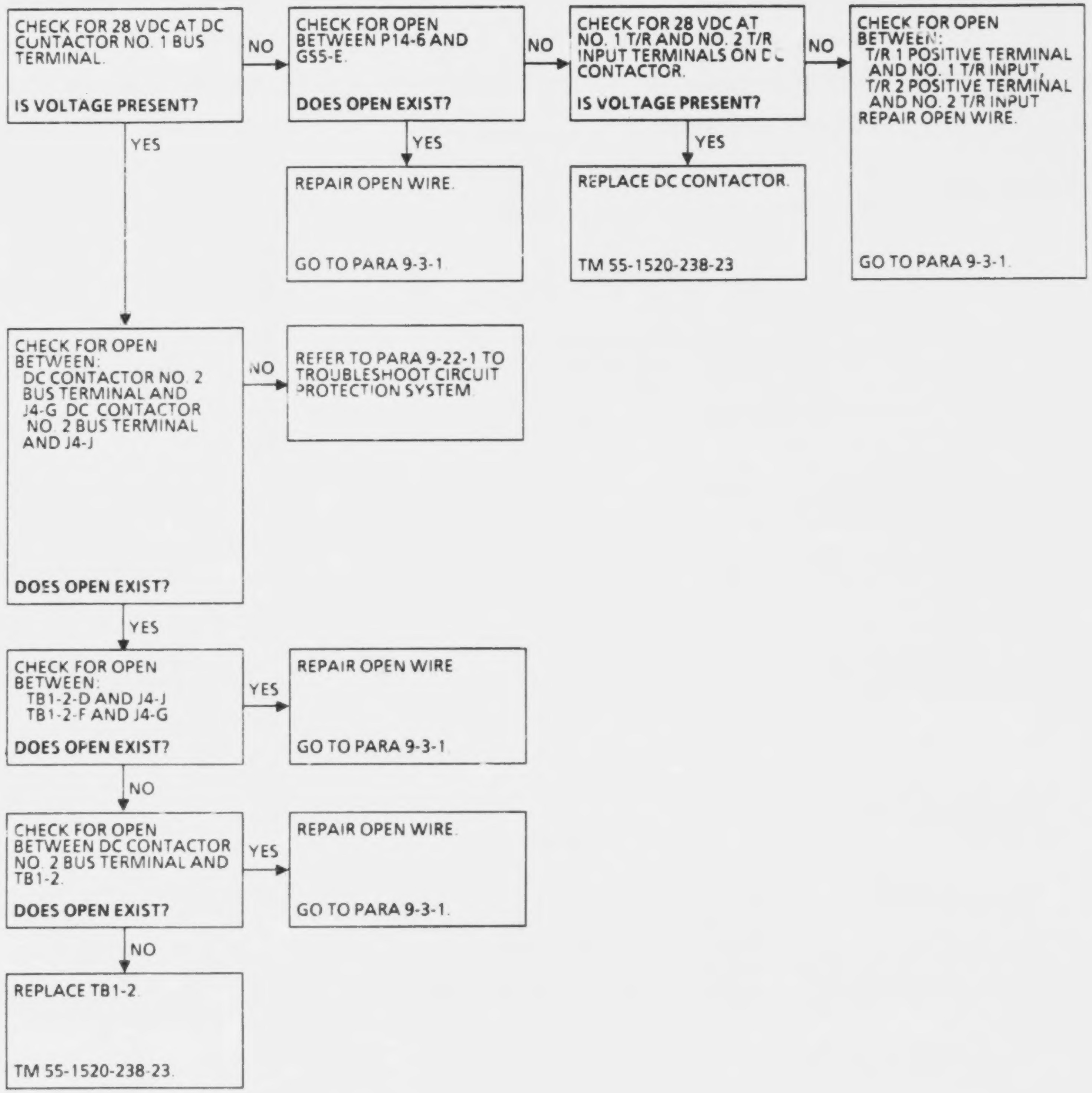
Personnel Required: (para 9-3-13)

References: (para 9-3-13)

Equipment Conditions: (para 9-3-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC CONTACTOR NO. 1 BUS TERMINAL.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN P14-6 AND GS5-E.
DOES OPEN EXIST?
NO
CHECK FOR 28 VDC AT NO. 1 T/R AND NO. 2 T/R INPUT TERMINALS ON DC CONTACTOR.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: T/R 1 POSITIVE TERMINAL AND NO. 1 T/R INPUT, T/R 2 POSITIVE TERMINAL AND NO. 2 T/R INPUT REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
YES
REPLACE DC CONTACTOR.
TM 55-1520-238-23
YES
CHECK FOR OPEN BETWEEN: DC CONTACTOR NO. 2 BUS TERMINAL AND J4-G DC CONTACTOR NO. 2 BUS TERMINAL AND J4-J
DOES OPEN EXIST?
NO
REFER TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN: TB1-2-D AND J4-J TB1-2-F AND J4-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-3-1
NO
CHECK FOR OPEN BETWEEN DC CONTACTOR NO. 2 BUS TERMINAL AND TB1-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REPLACE TB1-2.
TM 55-1520-238-23.

END OF TASK

9-3-15. DC ESSENTIAL BUS NO. 3 (PILOT STATION) - HAS NO POWER

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

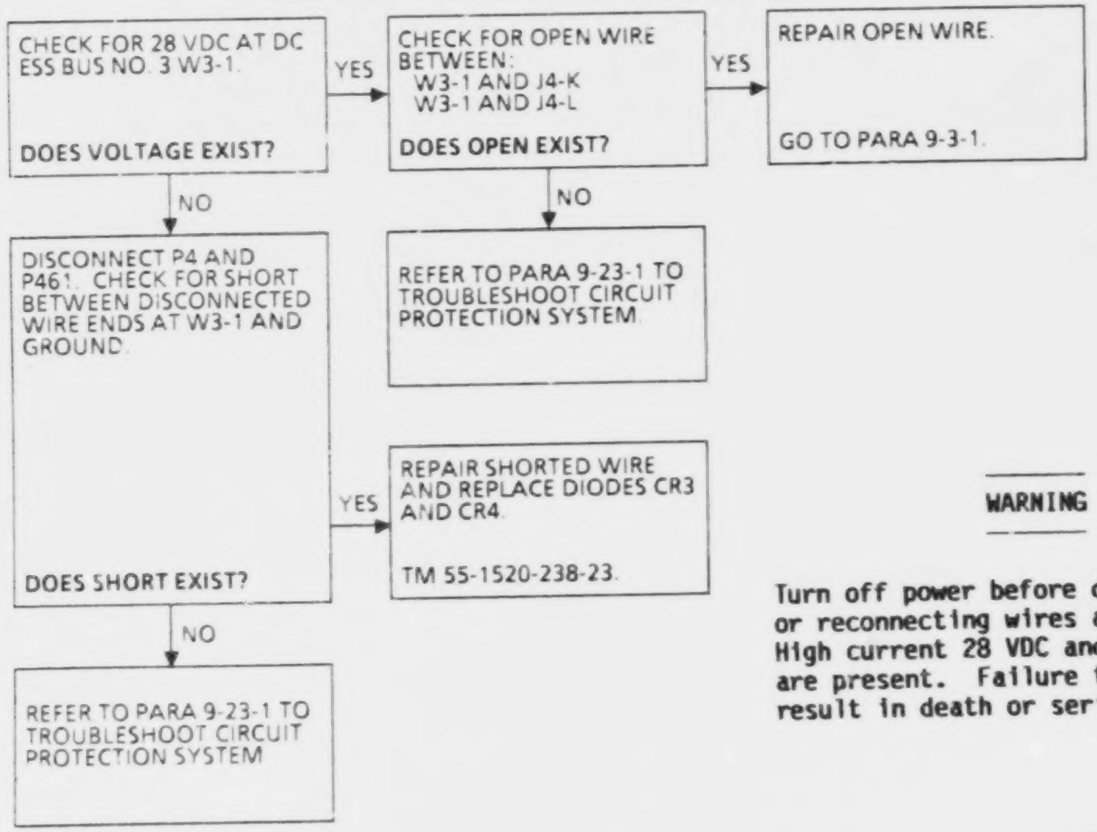
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
	External power application - Electrical


CHECK FOR 28 VDC AT DC ESS BUS NO. 3 W3-1.
DOES VOLTAGE EXIST?
YES
CHECK FOR OPEN WIRE BETWEEN: W3-1 AND J4-K W3-1 AND J4-L
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REFER TO PARA 9-23-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P4 AND P461. CHECK FOR SHORT BETWEEN DISCONNECTED WIRE ENDS AT W3-1 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE AND REPLACE DIODES CR3 AND CR4.
TM 55-1520-238-23.
NO
REFER TO PARA 9-23-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-3-16. DC ESSENTIAL BUS NO. 3 (CPG STATION) - HAS NO POWER

Tools: (para 9-3-15)

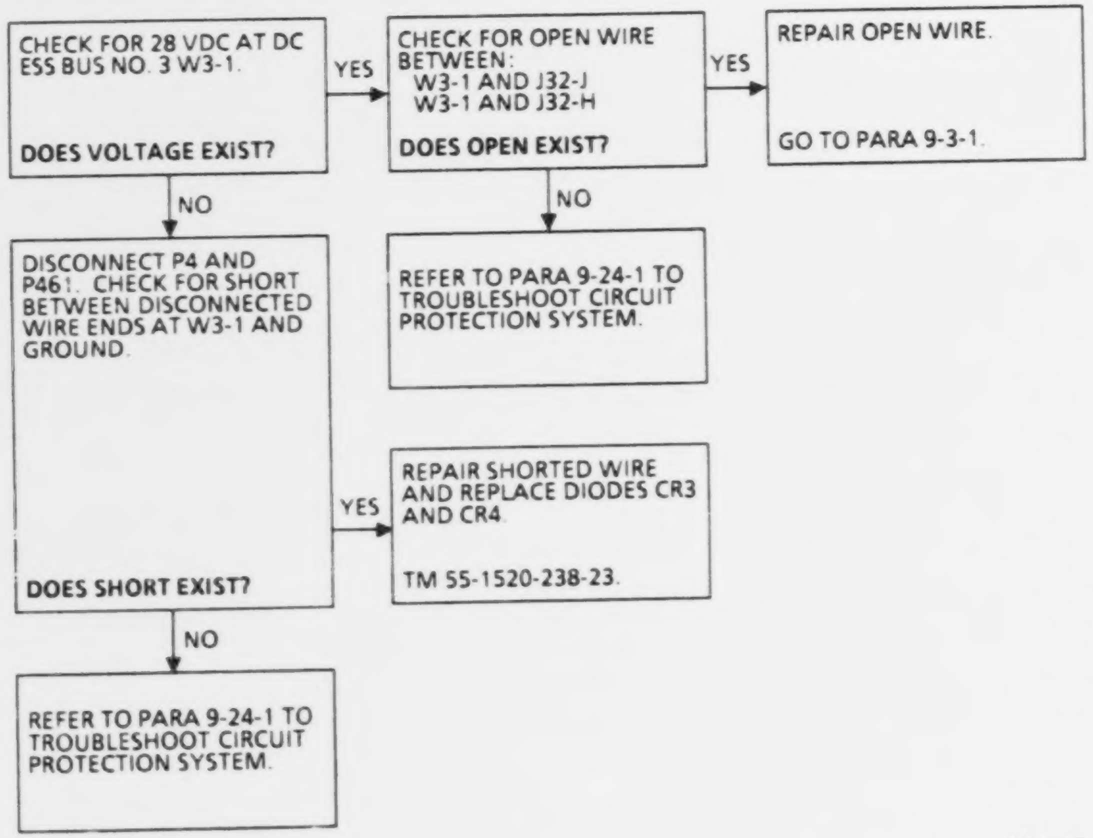
Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT DC ESS BUS NO. 3 W3-1.
DOES VOLTAGE EXIST?
YES
CHECK FOR OPEN WIRE BETWEEN: W3-1 AND J32-J W3-1 AND J32-H
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-3-1.
NO
REFER TO PARA 9-24-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P4 AND P461. CHECK FOR SHORT BETWEEN DISCONNECTED WIRE ENDS AT W3-1 AND GROUND.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE AND REPLACE DIODES CR3 AND CR4.
TM 55-1520-238-23.
NO
REFER TO PARA 9-24-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-3-17. HOT RECT 1 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

Personnel Required: (para 9-3-15)

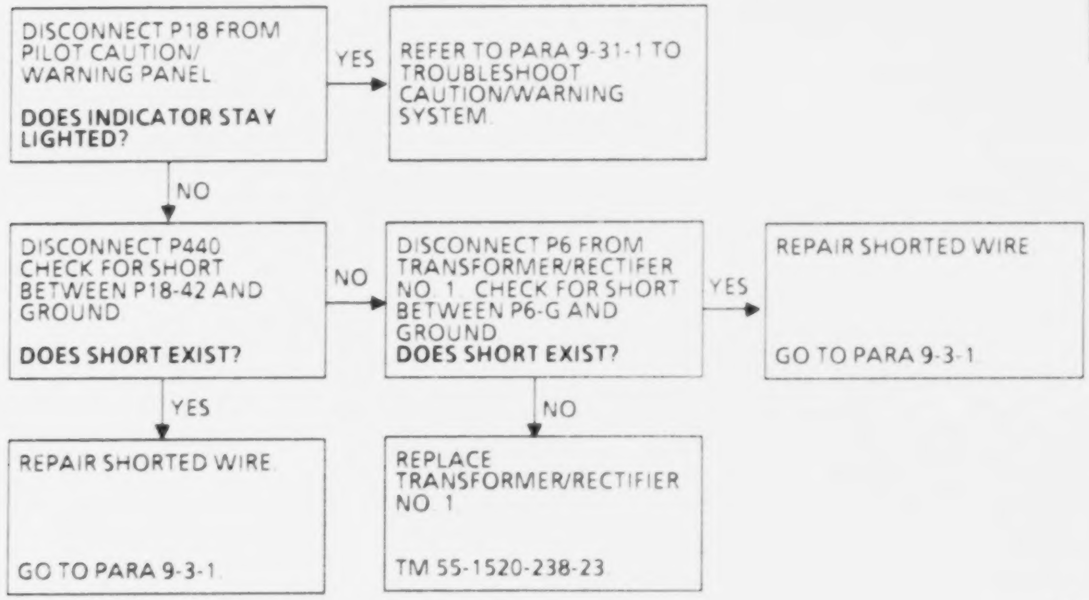
References: (para 9-3-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL. **DOES INDICATOR STAY LIGHTED?**

REFER TO PARA 9-31-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

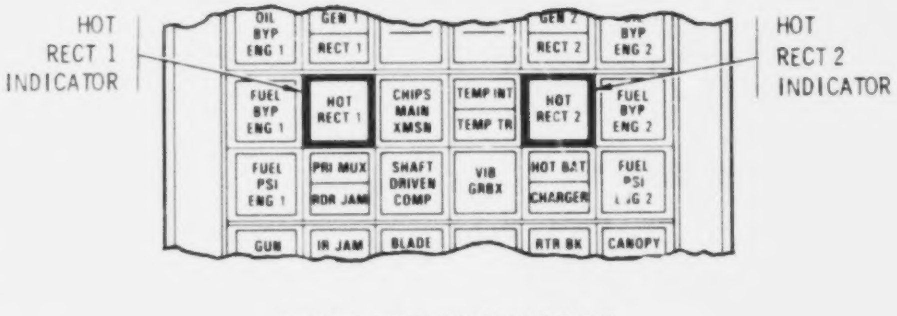
DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-42 AND GROUND. **DOES SHORT EXIST?**

DISCONNECT P6 FROM TRANSFORMER/RECTIFER NO. 1. CHECK FOR SHORT BETWEEN P6-G AND GROUND. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

REPLACE TRANSFORMER/RECTIFIER NO. 1. TM 55-1520-238-23



PILOT CAUTION/ WARNING PANEL

MM04/1-829A

END OF TASK

9-3-18. HOT RECT 2 INDICATOR - IS LIGHTED

Tools: (para 9-3-15)

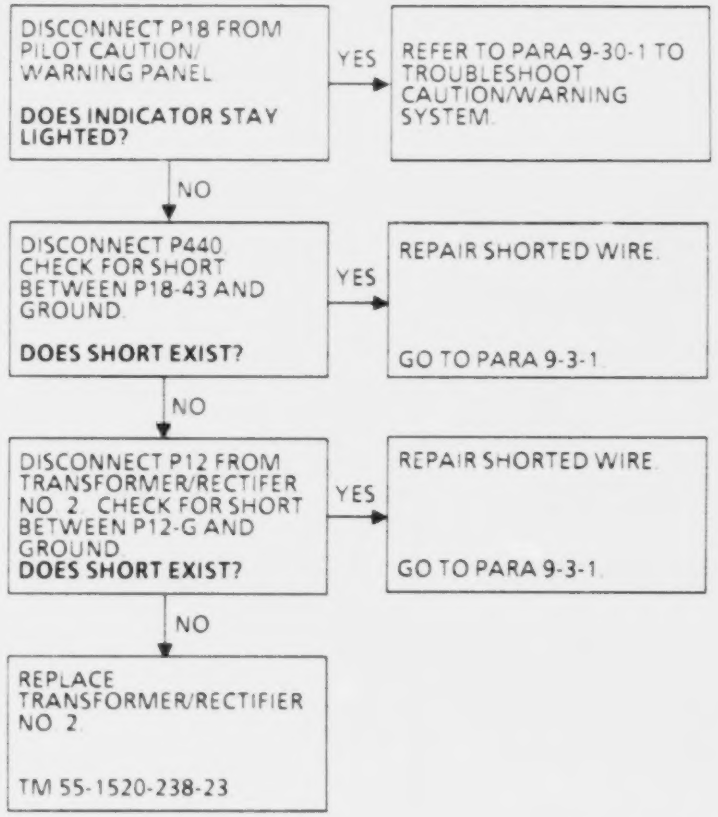
Personnel Required: (para 9-3-15)

References: (para 9-3-15)

Equipment Conditions: (para 9-3-17)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P18 FROM PILOT CAUTION/ WARNING PANEL. **DOES INDICATOR STAY LIGHTED?**

REFER TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

DISCONNECT P440. CHECK FOR SHORT BETWEEN P18-43 AND GROUND. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

DISCONNECT P12 FROM TRANSFORMER/RECTIFER NO. 2. CHECK FOR SHORT BETWEEN P12-G AND GROUND. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE. GO TO PARA 9-3-1.

REPLACE TRANSFORMER/RECTIFIER NO. 2. TM 55-1520-238-23

END OF TASK

9-3-19. RECT 1 INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

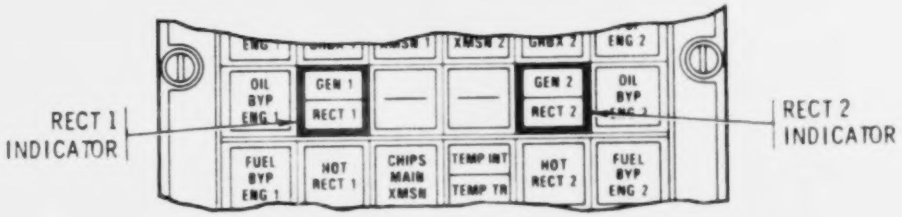
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

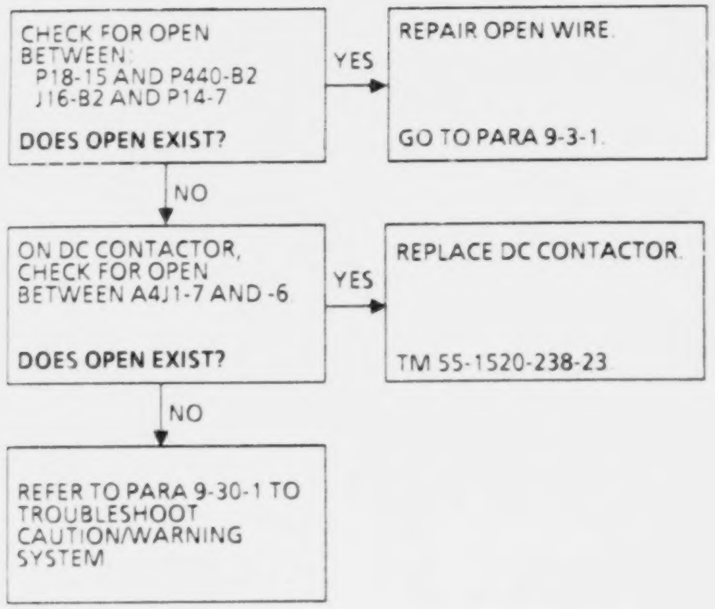
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed



PILOT CAUTION/ WARNING PANEL

MM04/1-845A



CHECK FOR OPEN BETWEEN:
P18-15 AND P440-B2
J16-B2 AND P14-7
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-3-1.

NO: ON DC CONTACTOR, CHECK FOR OPEN BETWEEN A4J1-7 AND -6.
DOES OPEN EXIST?

YES: REPLACE DC CONTACTOR. TM 55-1520-238-23.

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

END OF TASK

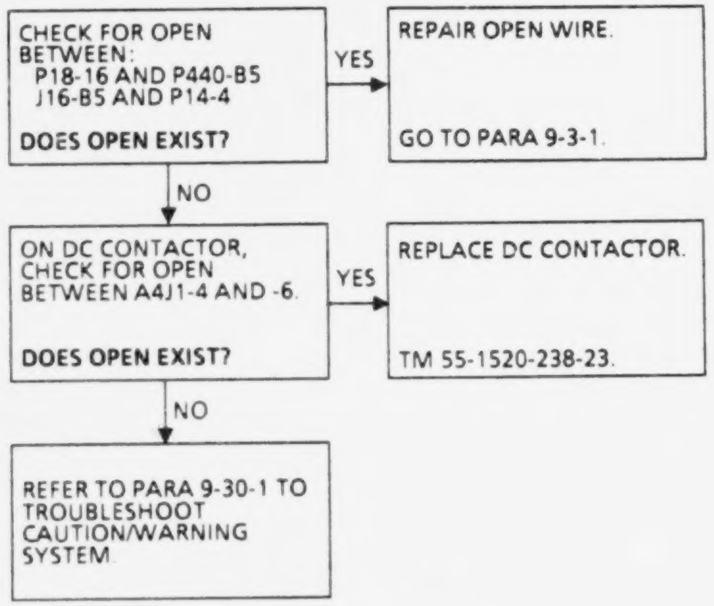
9-3-20. RECT 2 INDICATOR - IS NOT LIGHTED

Tools: (para 9-3-19)

Personnel Required: (para 9-3-19)

References: (para 9-3-19)

Equipment Conditions: (para 9-3-19)



CHECK FOR OPEN BETWEEN:
P18-16 AND P440-B5
J16-B5 AND P14-4
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-3-1.

NO: ON DC CONTACTOR, CHECK FOR OPEN BETWEEN A4J1-4 AND -6.
DOES OPEN EXIST?

YES: REPLACE DC CONTACTOR. TM 55-1520-238-23.

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.

END OF TASK

9-4-1. BATTERY - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

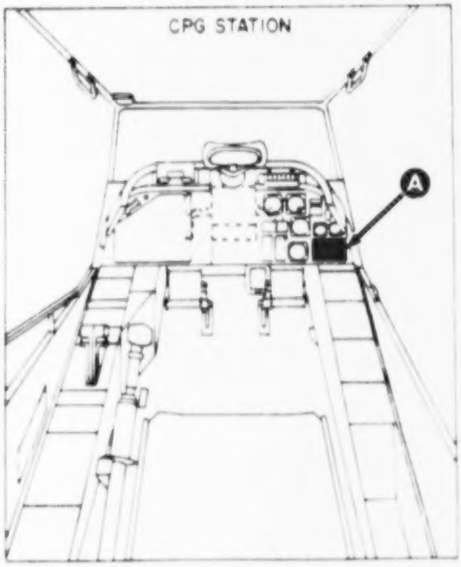
68F10 Aircraft Electrician

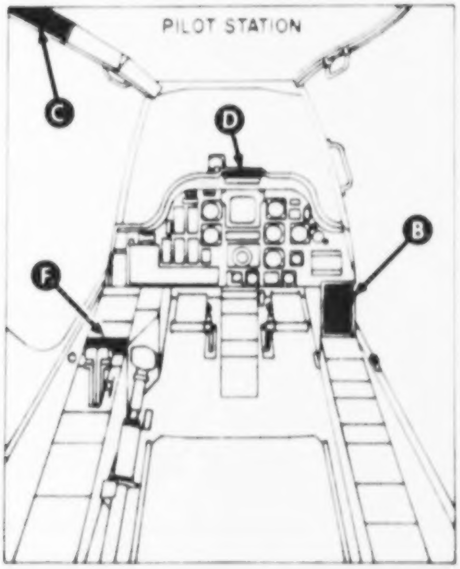
References:

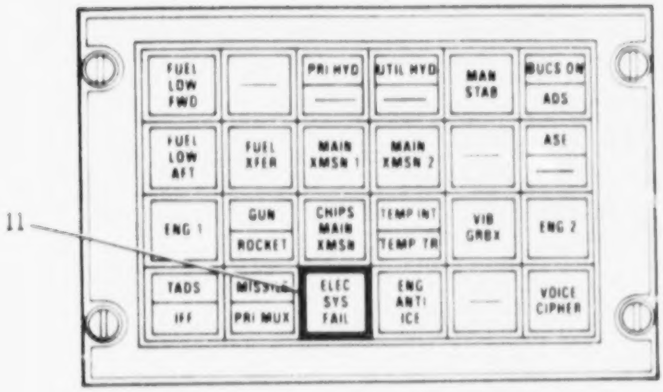
TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

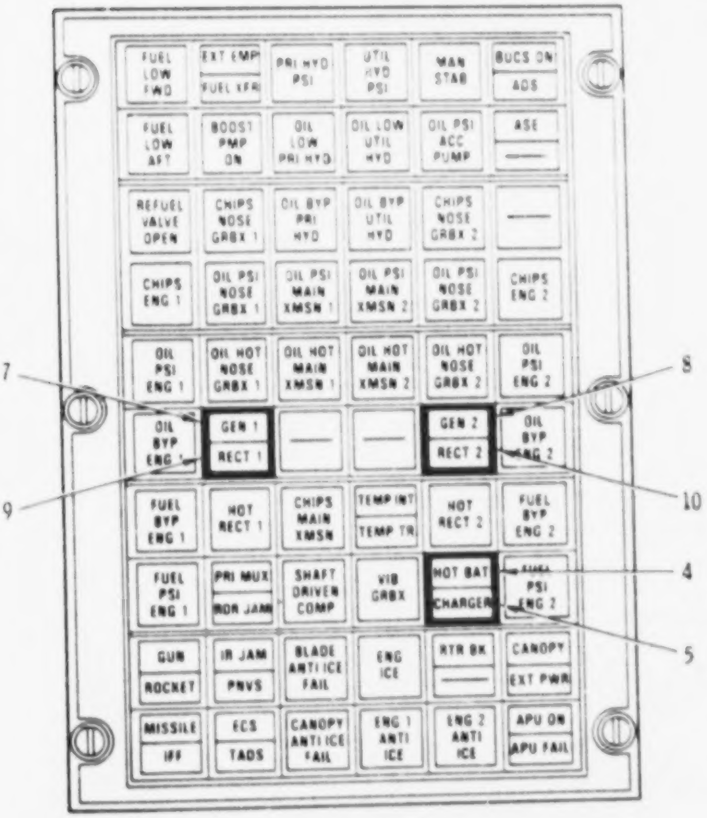
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R295 door opened
	Battery - connected







Ⓐ CPG CAUTION / WARNING PANEL

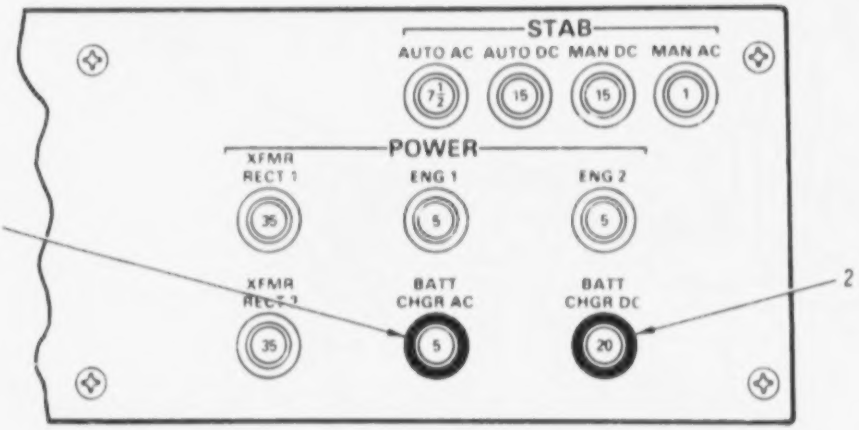


Ⓑ PILOT CAUTION / WARNING PANEL

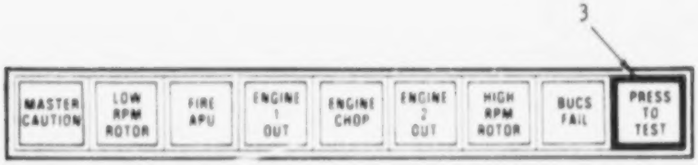
MM04/1-863-1A

GO TO NEXT PAGE

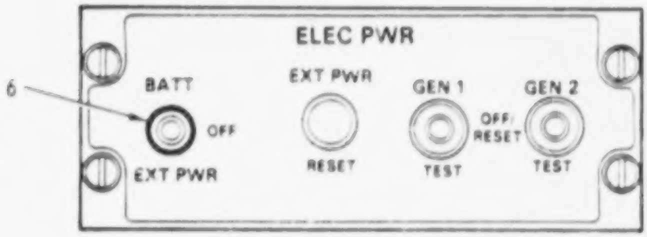
9-4-1. BATTERY - OPERATIONAL CHECK (cont)



C PILOT CIRCUIT BREAKER PANEL



D PILOT MASTER CAUTION / WARNING PANEL



F ELEC PWR PANEL

MM04/1-863-2A

A. Perform operational check as follows:

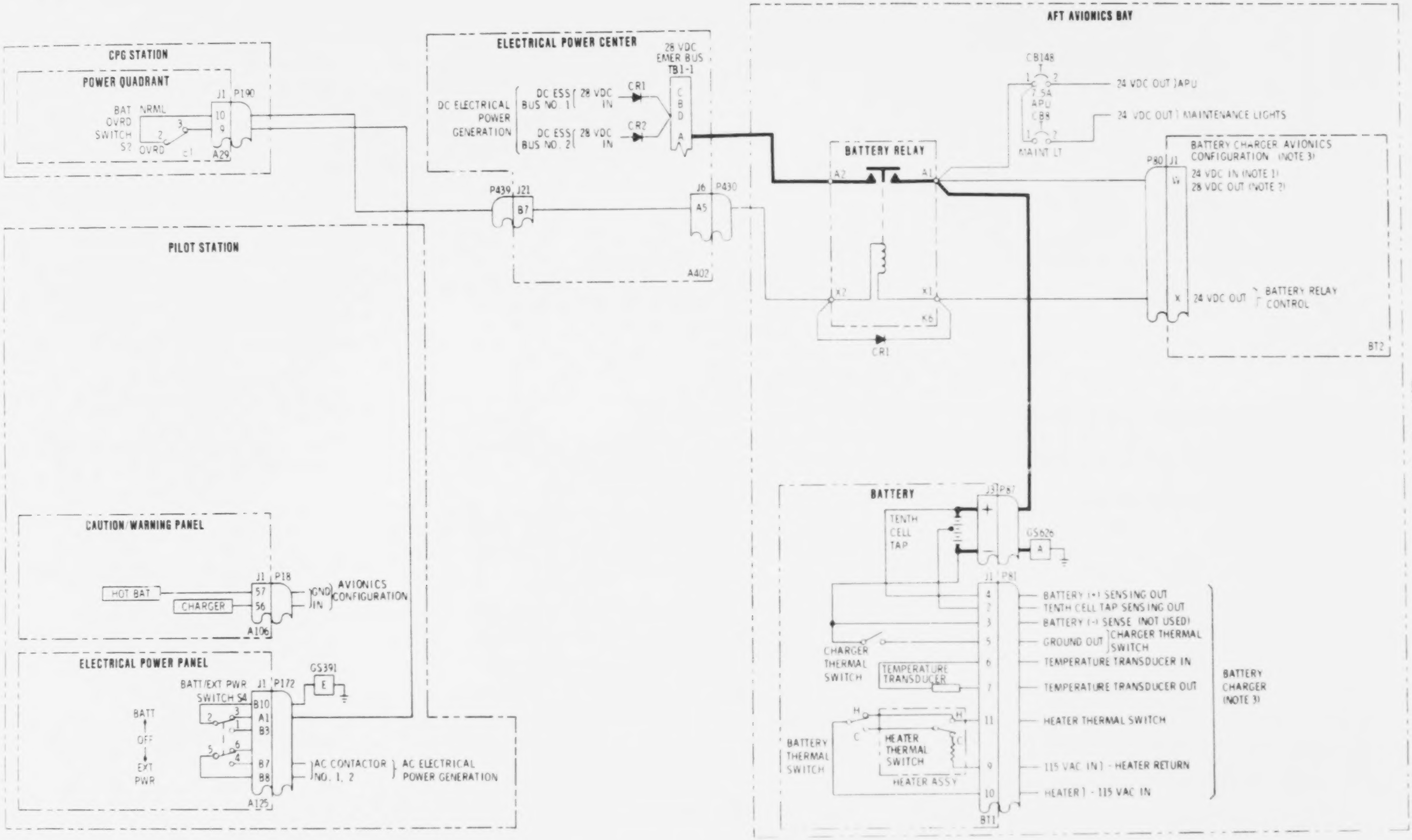
TASK	RESULT
1. On pilot master caution and caution/warning panels check that all caution and warning indicators are off.	If any caution/warning indicators are lighted, go to para 9-4-5.
2. On pilot aft circuit breaker panel, close **POWER BATT CHGR AC** (1) and **POWER BATT CHGR DC** (2) circuit breakers.	If **POWER BATT CHGR AC** (1) circuit breaker does not stay closed, refer to TM 11-1520-238-23-2. If **POWER BATT CHGR DC** (2) circuit breaker does not stay closed, refer to TM 11-1520-238-23-2.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (6) to **BATT**.	If **POWER BATT CHGR AC** (1) or **POWER BATT CHGR DC** (2) circuit breakers do not stay closed, replace battery charger (TM 11-1520-238-23-2). If **HOT BAT** (4) or **CHARGER** (5) indicators are lighted, refer to TM 11-1520-238-23-2.
4. On pilot master caution/warning panel, depress **PRESS TO TEST** (3) indicator.	If no caution/warning indicators are lighted, go to para 9-4-4.
5. On pilot caution/warning panel, check that **GEN 1** (7), **GEN 2** (8), **RECT 1** (9), and **RECT 2** (10) indicators are lighted.	If **GEN 1** (7) indicator is not lighted, go to para 9-2-10. If **GEN 2** (8) indicator is not lighted, go to para 9-2-7. If **RECT 1** (9) indicator is not lighted, go to para 9-3-19. If **RECT 2** (10) indicator is not lighted, go to para 9-3-20.
6. On CPG caution/warning panel, check **ELEC SYS FAIL** (11) indicator is lighted.	If **ELEC SYS FAIL** (11) indicator is not lighted, go to para 9-32-1.

B. Disconnect battery (TM 55-1520-238-23).

C. Secure door R295 (TM 55-1520-238-23).

END OF TASK

9-4-2. BATTERY - INTERCONNECTION DIAGRAM

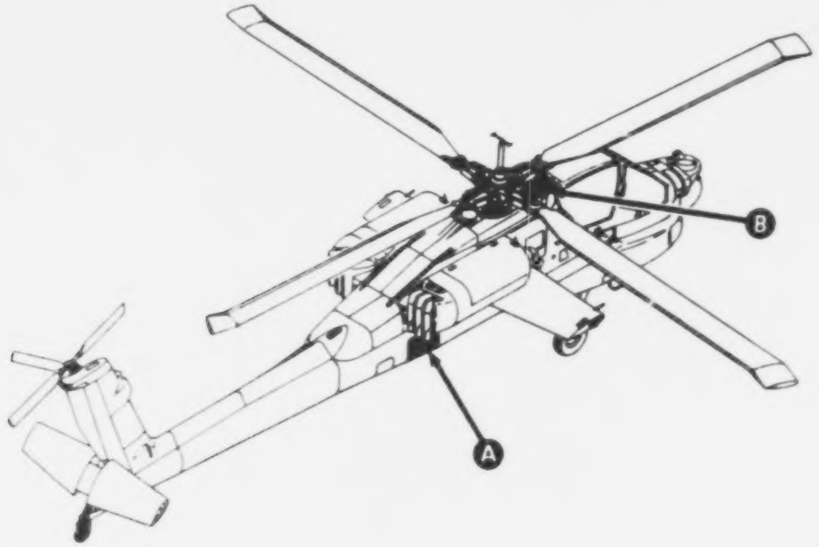


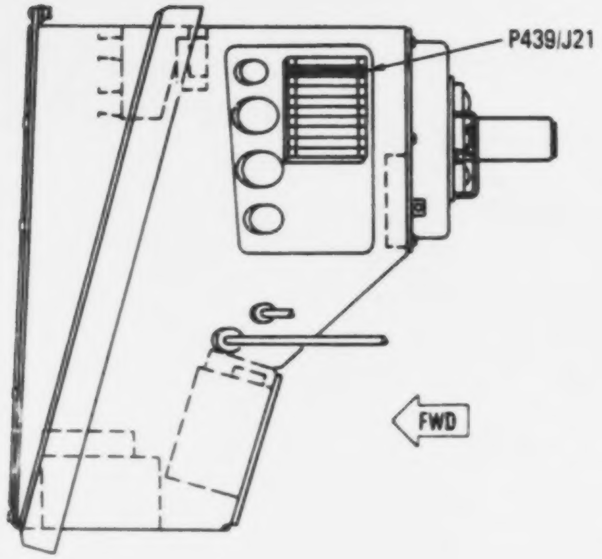
NOTES

1. USING BATTERY FOR EMERGENCY POWER
2. DURING OPERATION OF POWER PLANTS
3. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL

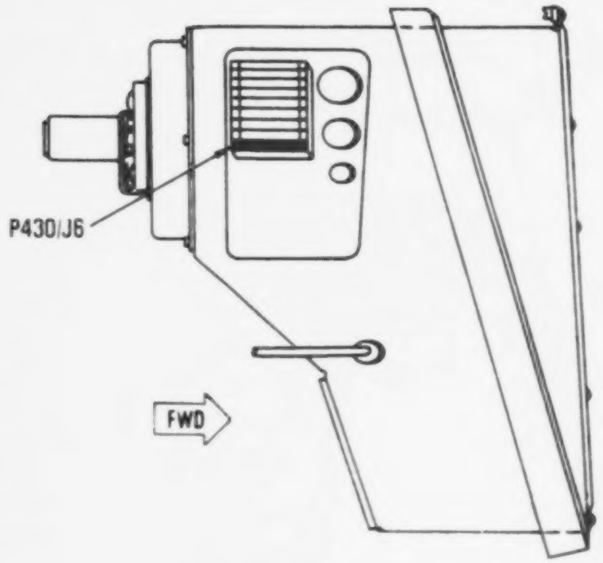
MM04/1-736B

9-4-3. BATTERY - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

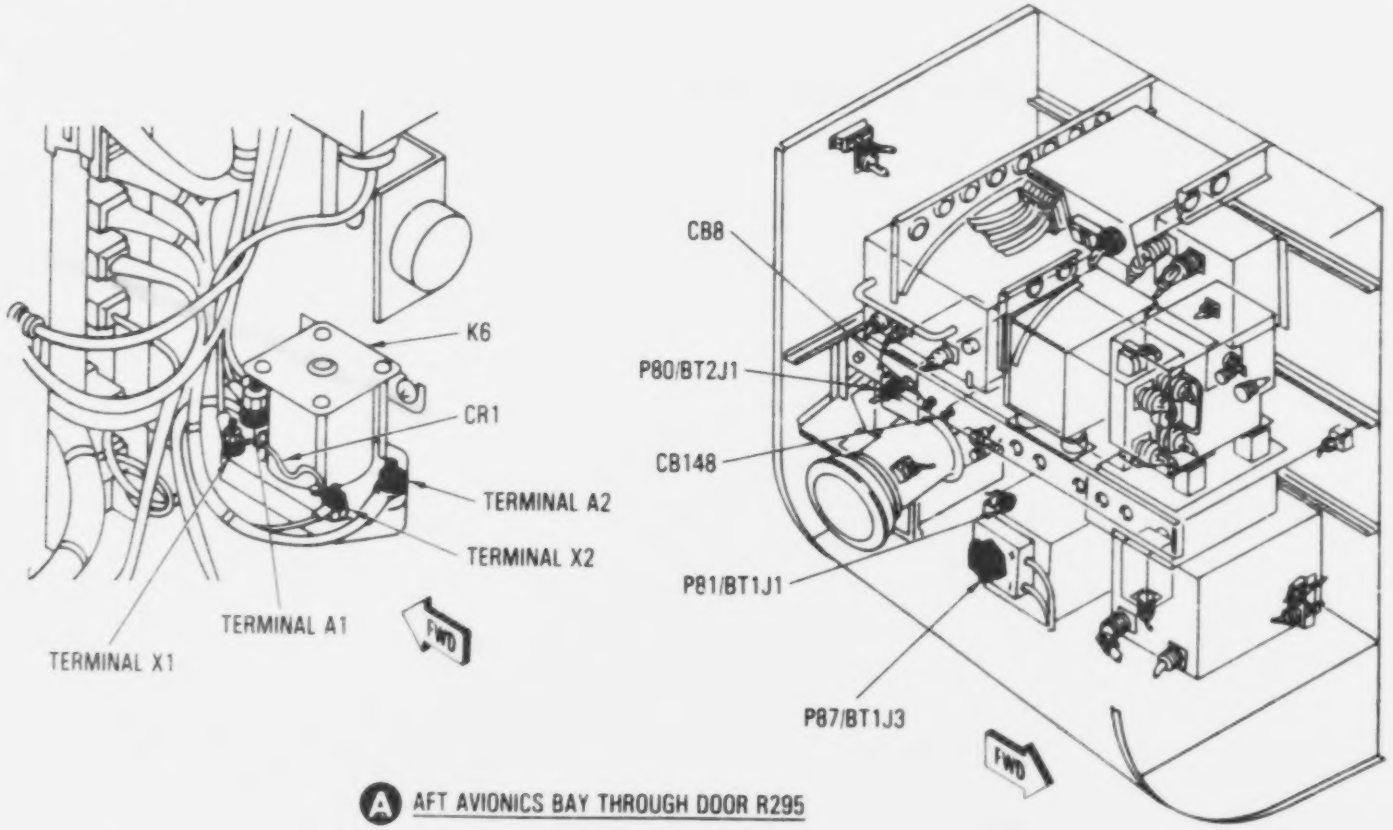




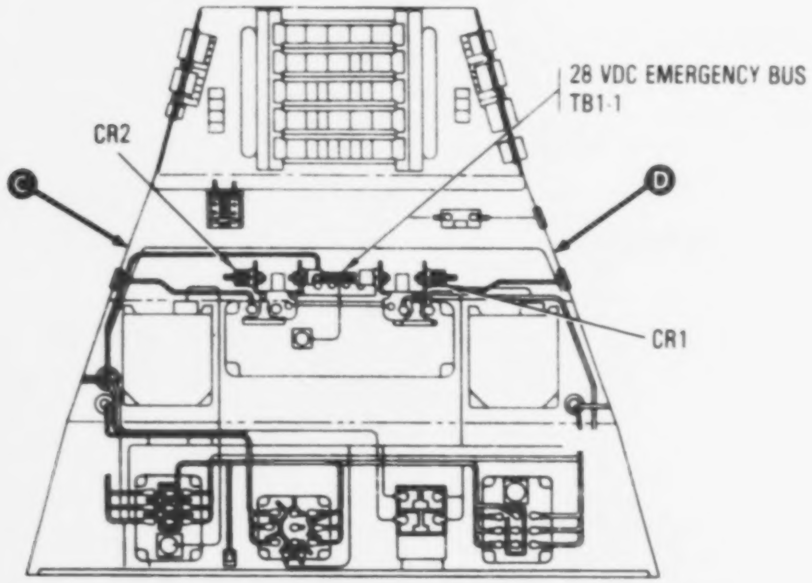
D ELECTRICAL POWER CENTER
LEFT SIDE



C ELECTRICAL POWER CENTER
RIGHT SIDE



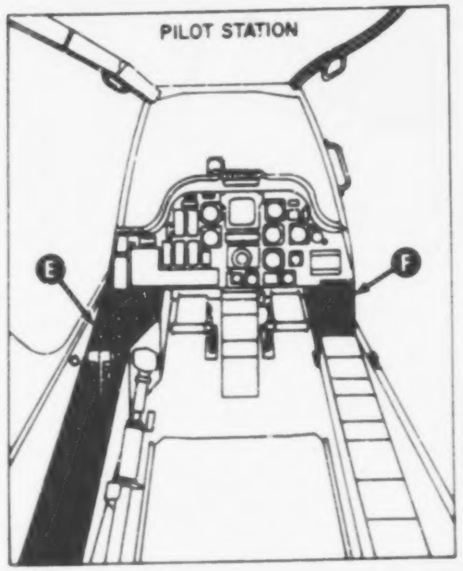
A AFT AVIONICS BAY THROUGH DOOR R295

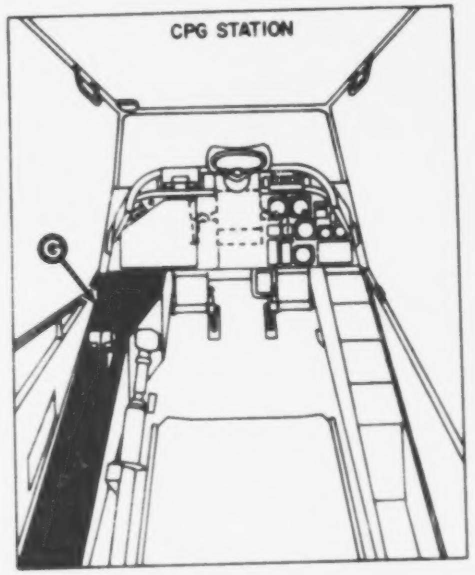


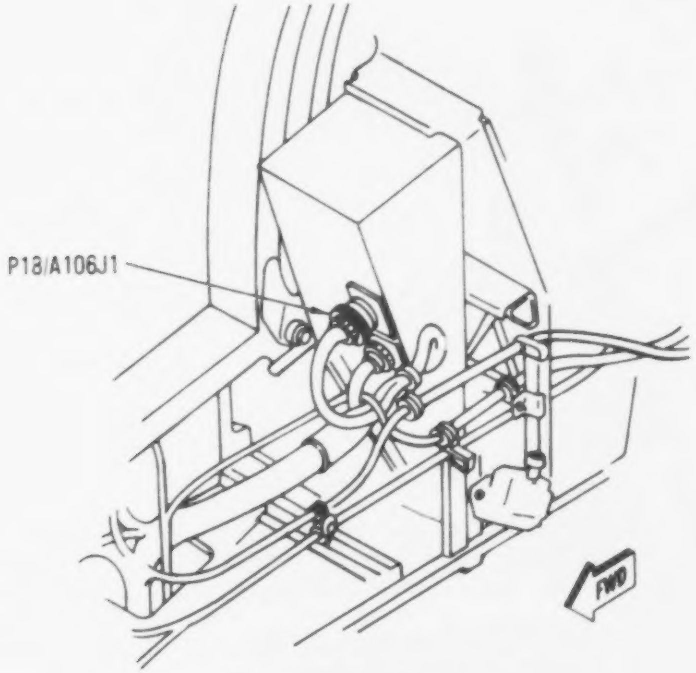
B ELECTRICAL POWER CENTER
(COVER REMOVED)

MM04/1-1294-1A

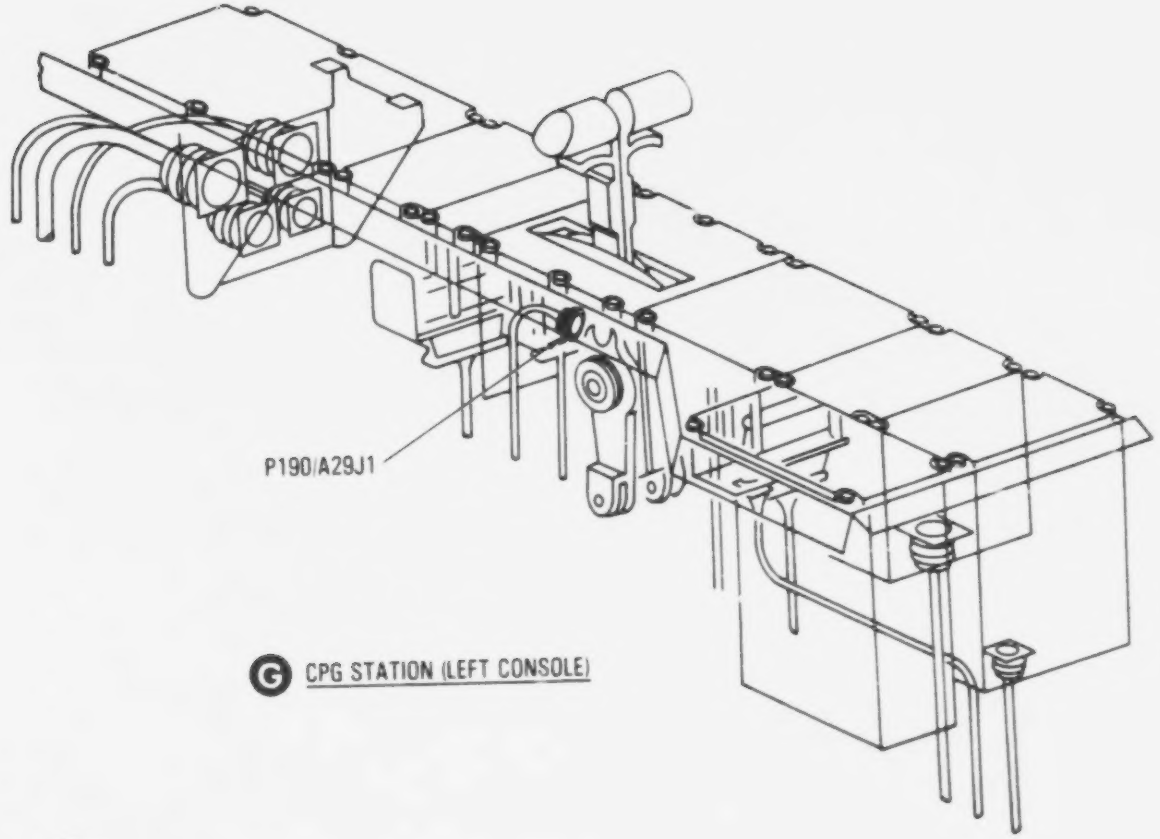
9-4-3. BATTERY - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



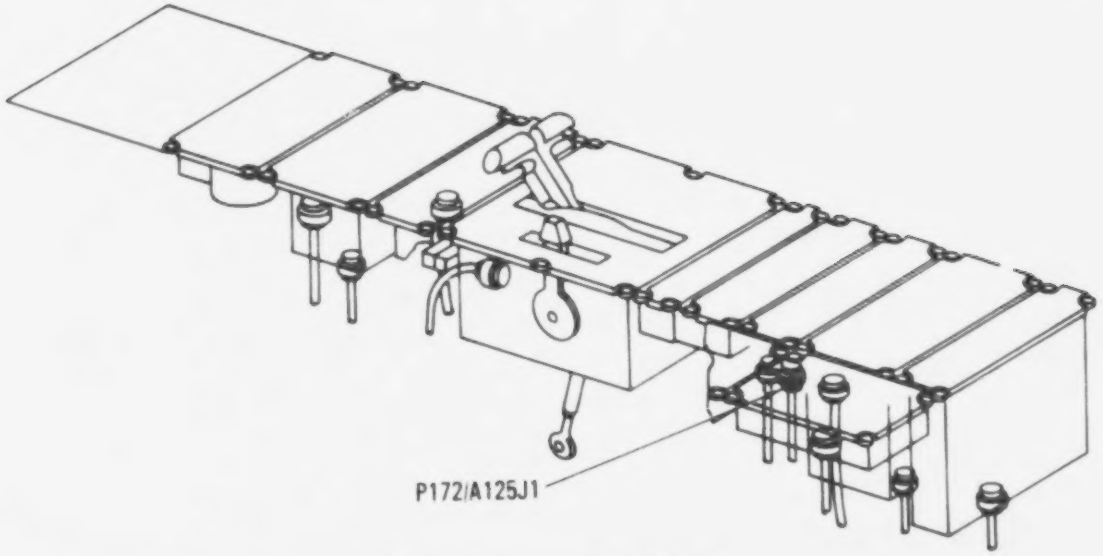




F PILOT CAUTION/WARNING PANEL



G CPG STATION (LEFT CONSOLE)



E PILOT STATION (LEFT CONSOLE)

MM04/1-1294-2A

9-4-4. BATTERY - DOES NOT COME ON LINE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

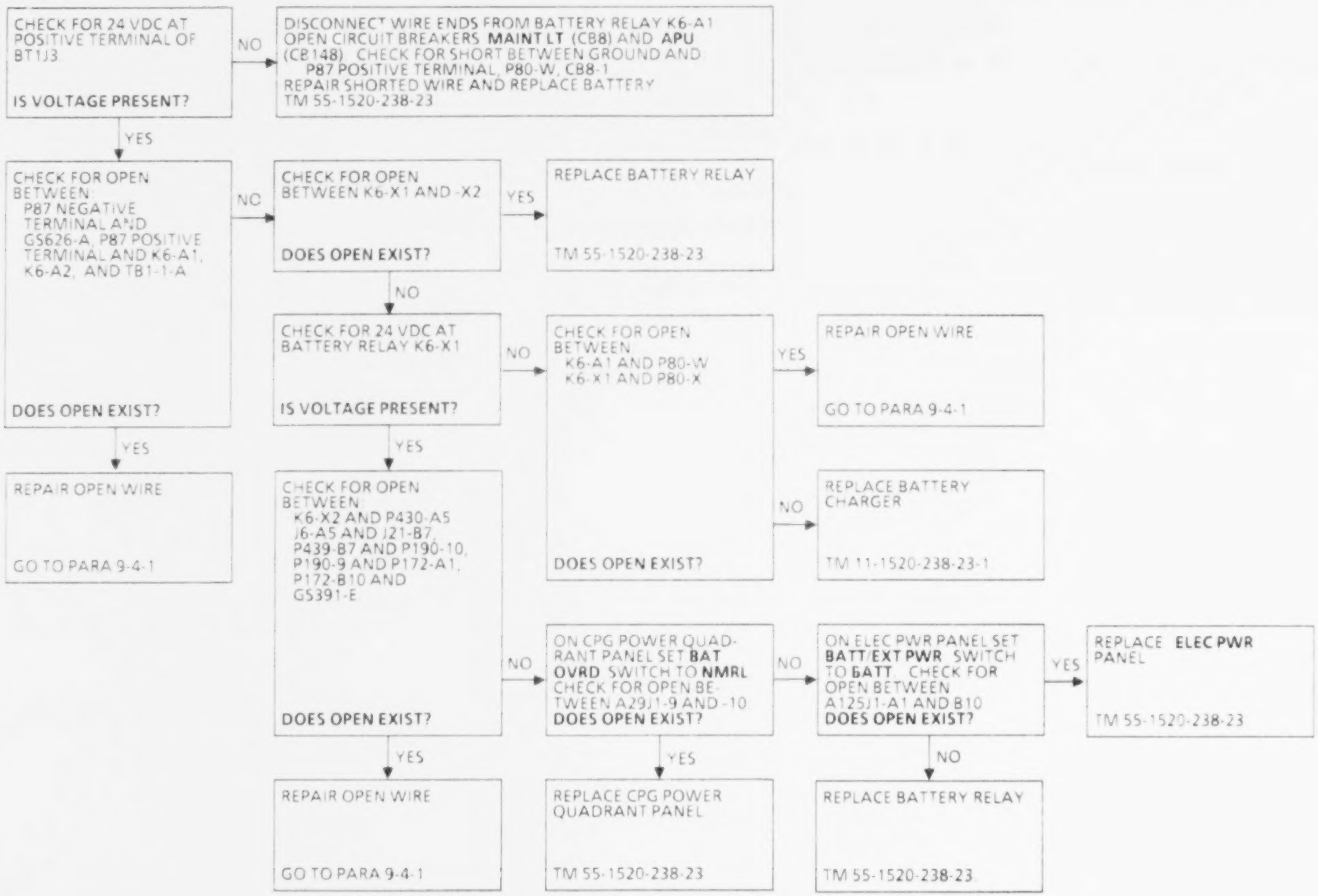
TM 55-1520-238-23
TM 11-1520-238-23-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Access provisions - R295 door opened
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 24 VDC AT POSITIVE TERMINAL OF BT1J3
IS VOLTAGE PRESENT?
NO
DISCONNECT WIRE ENDS FROM BATTERY RELAY K6-A1 OPEN CIRCUIT BREAKERS MAINT LT (CB8) AND APU (CB148) CHECK FOR SHORT BETWEEN GROUND AND P87 POSITIVE TERMINAL, P80-W, CB8-1 REPAIR SHORTED WIRE AND REPLACE BATTERY TM 55-1520-238-23
YES
CHECK FOR OPEN BETWEEN: P87 NEGATIVE TERMINAL AND GS626-A, P87 POSITIVE TERMINAL AND K6-A1, K6-A2, AND TB1-1-A
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN K6-X1 AND -X2
DOES OPEN EXIST?
YES
REPLACE BATTERY RELAY
TM 55-1520-238-23
YES
REPAIR OPEN WIRE
GO TO PARA 9-4-1
NO
CHECK FOR 24 VDC AT BATTERY RELAY K6-X1
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN K6-A1 AND P80-W K6-X1 AND P80-X
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-4-1
NO
REPLACE BATTERY CHARGER
TM 11-1520-238-23-1
YES
CHECK FOR OPEN BETWEEN: K6-X2 AND P430-A5 J6-A5 AND J21-B7, P439-B7 AND P190-10, P190-9 AND P172-A1, P172-B10 AND GS391-E
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-4-1
NO
ON CPG POWER QUADRANT PANEL SET BAT OVRD SWITCH TO NMRL CHECK FOR OPEN BETWEEN A29J1-9 AND -10
DOES OPEN EXIST?
YES
REPLACE CPG POWER QUADRANT PANEL
TM 55-1520-238-23
NO
ON ELEC PWR PANEL SET BATT/EXT PWR SWITCH TO BATT. CHECK FOR OPEN BETWEEN A125J1-A1 AND B10
DOES OPEN EXIST?
YES
REPLACE ELEC PWR PANEL
TM 55-1520-238-23
NO
REPLACE BATTERY RELAY
TM 55-1520-238-23

END OF TASK

9-4-5. CAUTION/WARNING INDICATORS - ARE ILLUMINATED WITH POWER OFF AND BATTERY CONNECTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

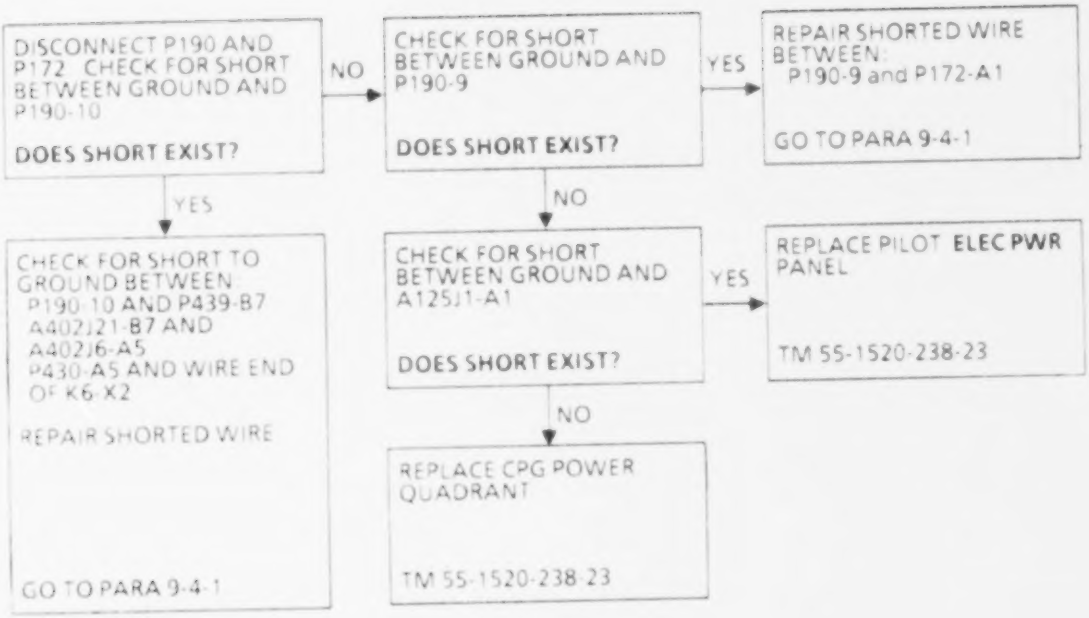
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - door R295 opened


DISCONNECT P190 AND P172. CHECK FOR SHORT BETWEEN GROUND AND P190-10
DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P190-9
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P190-9 and P172-A1
GO TO PARA 9-4-1
YES
CHECK FOR SHORT TO GROUND BETWEEN: P190-10 AND P439-B7 A402J21-B7 AND A402J6-A5 P430-A5 AND WIRE END OF K6-X2
REPAIR SHORTED WIRE
GO TO PARA 9-4-1
NO
CHECK FOR SHORT BETWEEN GROUND AND A125J1-A1
DOES SHORT EXIST?
YES
REPLACE PILOT ELEC PWR PANEL
TM 55-1520-238-23
NO
REPLACE CPG POWER QUADRANT
TM 55-1520-238-23

END OF TASK

9-5-1. EXTERNAL POWER AND GROUND SERVICE UTILITY RECEPTACLE - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

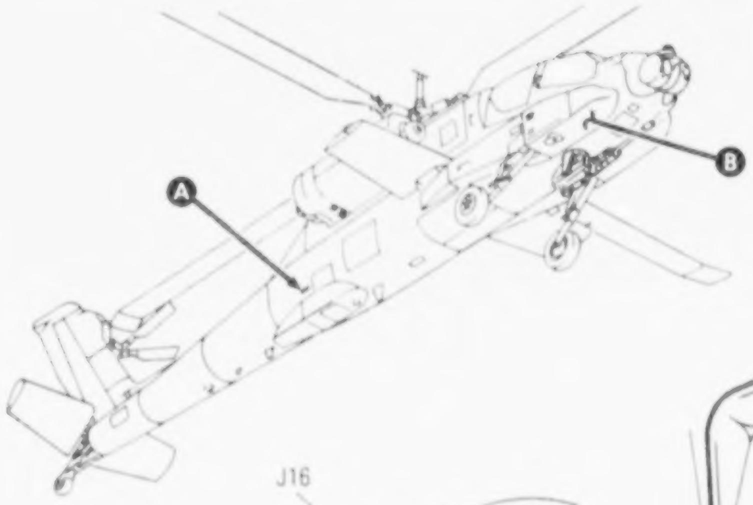
TM 55-1520-238-23

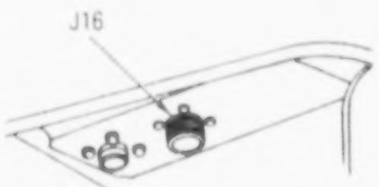
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Access provisions - Doors B60R and R345 open

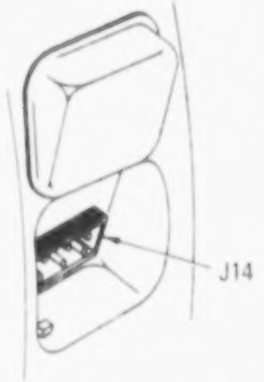
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

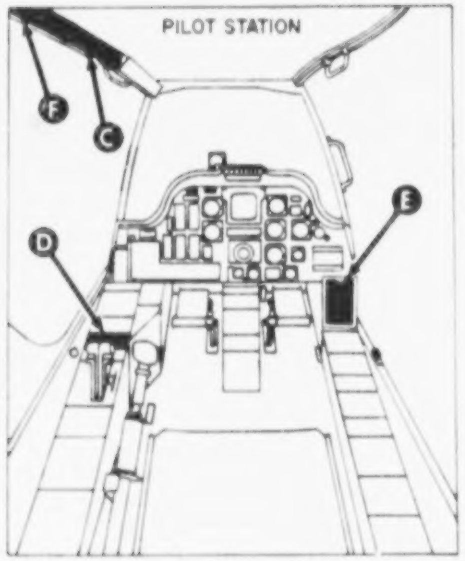


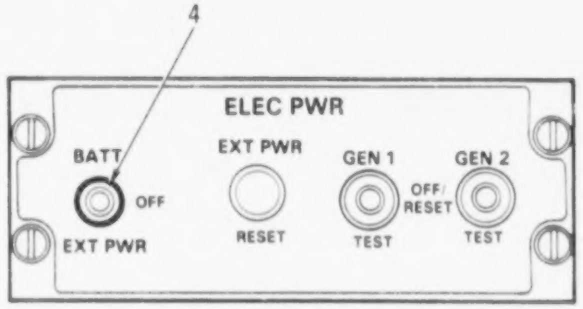


B GROUND SERVICE UTILITY RECEPTACLE THROUGH DOOR B60R

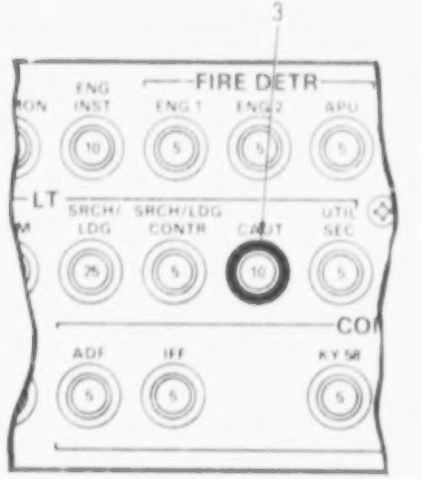


A EXTERNAL POWER RECEPTACLE THROUGH DOOR R345

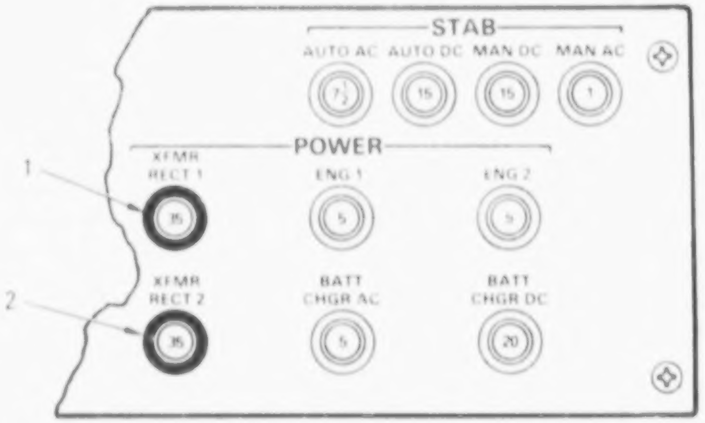




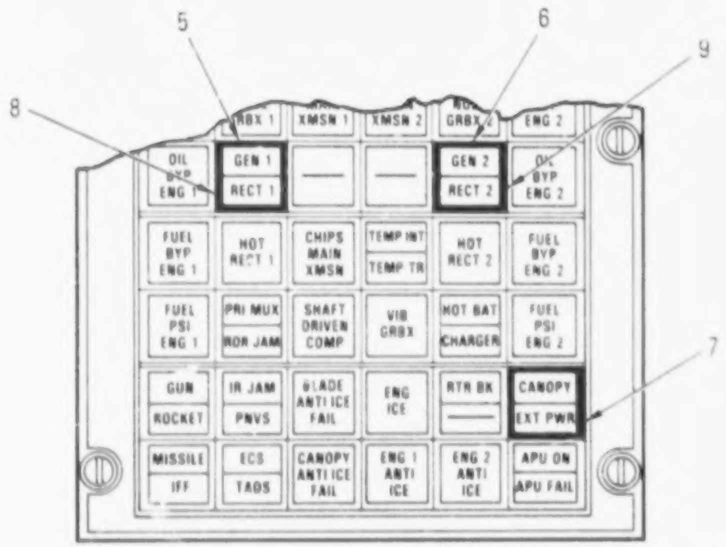
D EXT PWR PANEL



PILOT CENTER CIRCUIT BREAKER PANEL



F PILOT AFT CIRCUIT BREAKER PANEL



E PILOT CAUTION/WARNING PANEL

MM04/1-902C

GO TO NEXT PAGE

9-5-1. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (4) to **EXT PWR** position.	
2. On pilot circuit breaker panel, check that **POWER XFMR RECT 1** (1), **POWER XFMR RECT 2** (2), and **LT CAUT** (3) circuit breakers are closed.	If **POWER XFMR RECT 1** circuit breaker (1) does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** circuit breaker (2) does not stay closed, go to para 9-3-7. If **LT CAUT** circuit breaker (3) does not stay closed, go to para 9-31-1.
3. On pilot caution/warning panel, check that **GEN 1** (5), **GEN 2** (6) and **EXT PWR** (7) indicator are lighted.	If not lights are illuminated, go to para 9-5-6. If **GEN 1** indicator (5) is not lighted, go to para 9-2-8. If **GEN 2 indicator** (6) is not lighted, go to para 9-2-9. If **EXT PWR** indicator (7) is not lighted, go to para 9-5-10.
4. On pilot caution/warning panel, check that **RECT 1** (8) and **RECT 2** (9) indicators are not lighted.	If **RECT 1** indicator (8) is lighted, go to para 9-3-8. If **RECT 2** indicator (9) is lighted, go to para 9-3-9. If both indicators are lighted, go to para 9-5-6.
5. On ground service receptacle, check for 115 VAC at J16-B, J16-F, and J16-E.	If 115 VAC is not present at J16-B, and J16-F, and J16-E, go to para 9-5-8.
6. On ground service receptacle, check for 28 VDC at J16-A.	If 28 VDC is not present at J16-A, go to para 9-5-9.
7. Perform power down, para 9-5-3.	
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (4) to **BATT** position.	
9. On pilot caution/warning panel, check that **EXT PWR** indicator (7) is not lighted.	If **EXT PWR** indicator (7) is lighted, go to para 9-5-11.
10 On **ELEC PWR** panel, set **BATT/EXT PWR** switch (4) to **OFF**.	

END OF TASK

9-5-2. EXTERNAL POWER - POWER UP

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

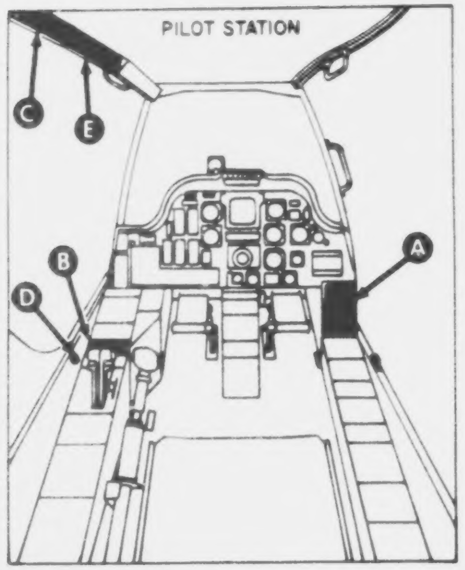
68F10 Aircraft Electrician

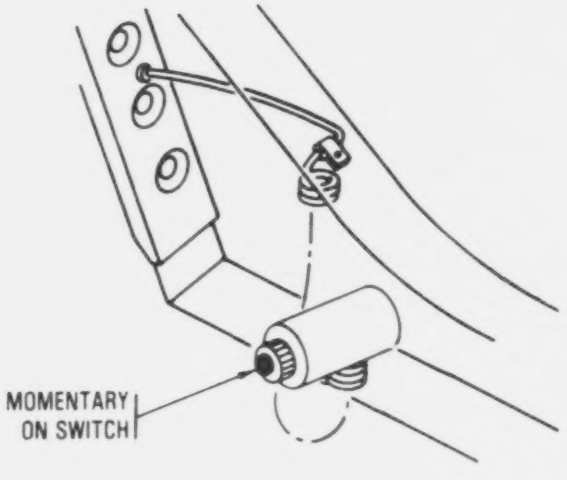
References:

TM 55-1520-238-23

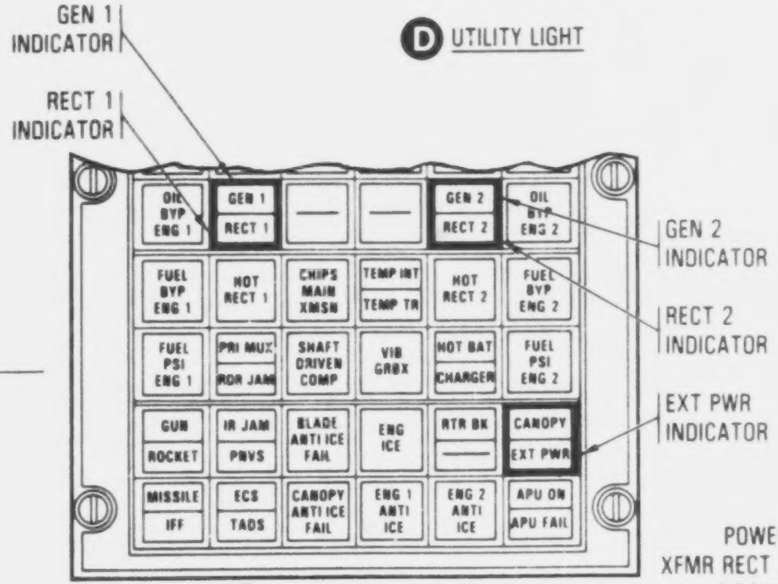
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

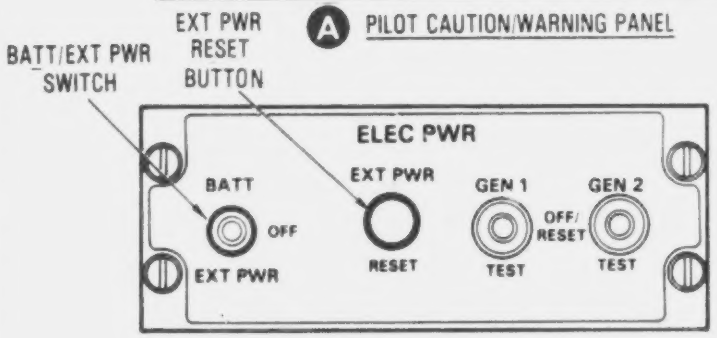




D UTILITY LIGHT



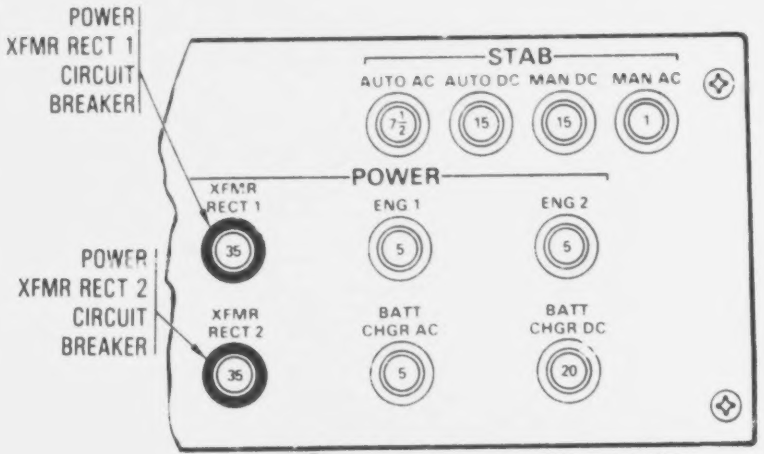
A PILOT CAUTION/WARNING PANEL



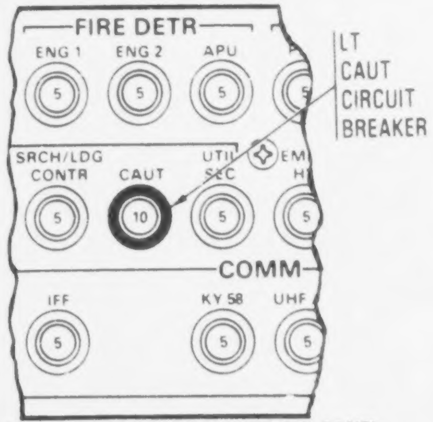
B ELEC PWR PANEL

A. Perform power up as follows:

TASK	RESULT
1. On **ELEC PWR** panel, set **BATT/EXT PWR** switch to **EXT PWR.**	If power does not come on, depress the **EXT PWR RESET** switch. If power still does not come on, go to para 9-5-12.
2. On pilot circuit breaker panel, check that **POWER XFMR RECT 1, POWER XFMR RECT 2,** and **LT CAUT** circuit breakers are closed.	If **POWER XFMR RECT 1** circuit breaker does not stay closed, go to para 9-3-6. If **POWER XFMR RECT 2** circuit breaker does not stay closed, go to para 9-3-7. If **LT CAUT** circuit breaker does not stay closed, go to para 9-31-1.
3. On utility light press momentary on switch. Check that utility light and caution/warning lights are lighted.	If utility light and caution/warning lights are not lighted, go to para 9-3-1.
4. On pilot caution/warning panel, check that **GEN 1, GEN 2,** and **EXT PWR** indicators are lighted.	If **GEN 1** indicator is not lighted, go to para 9-2-8. If **GEN 2** indicator is not lighted, go to para 9-2-9. If **EXT PWR** indicator is not lighted, go to para 9-5-10.
5. On pilot caution/warning panel, check that **RECT 1** and **RECT 2** indicators are not lighted.	If **RECT 1** indicator is lighted, go to para 9-3-8. If **RECT 2** indicator is lighted, go to para 9-3-9.



C PILOT AFT CIRCUIT BREAKER PANEL



E PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-903B

END OF TASK

9-5-3. EXTERNAL POWER - POWER DOWN

Personnel Required: (para 9-5-2)

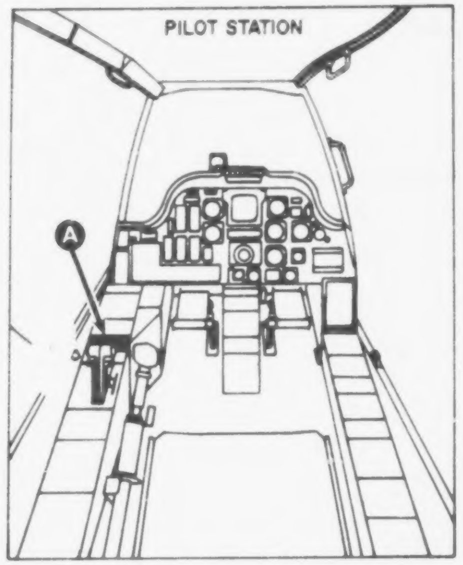
References: (para 9-5-2)

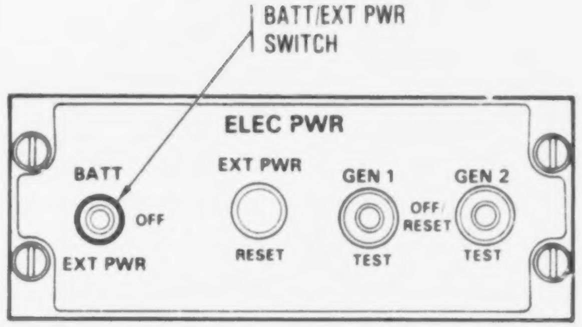
Equipment Conditions: (para 9-5-2)

A. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.

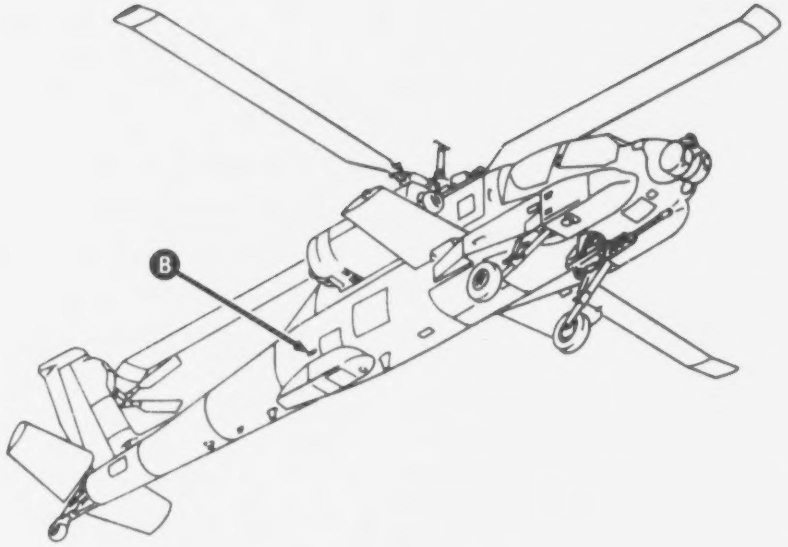
B. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

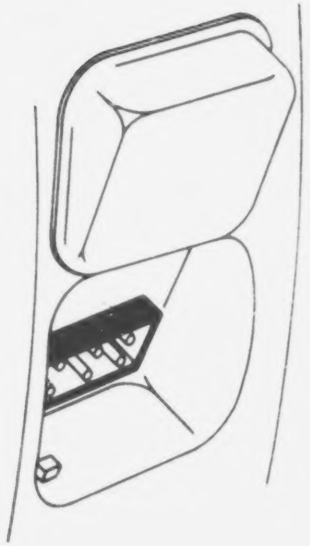
C. Secure doors R345 and B60R (TM 55-1520-238-23).





A ELEC PWR PANEL



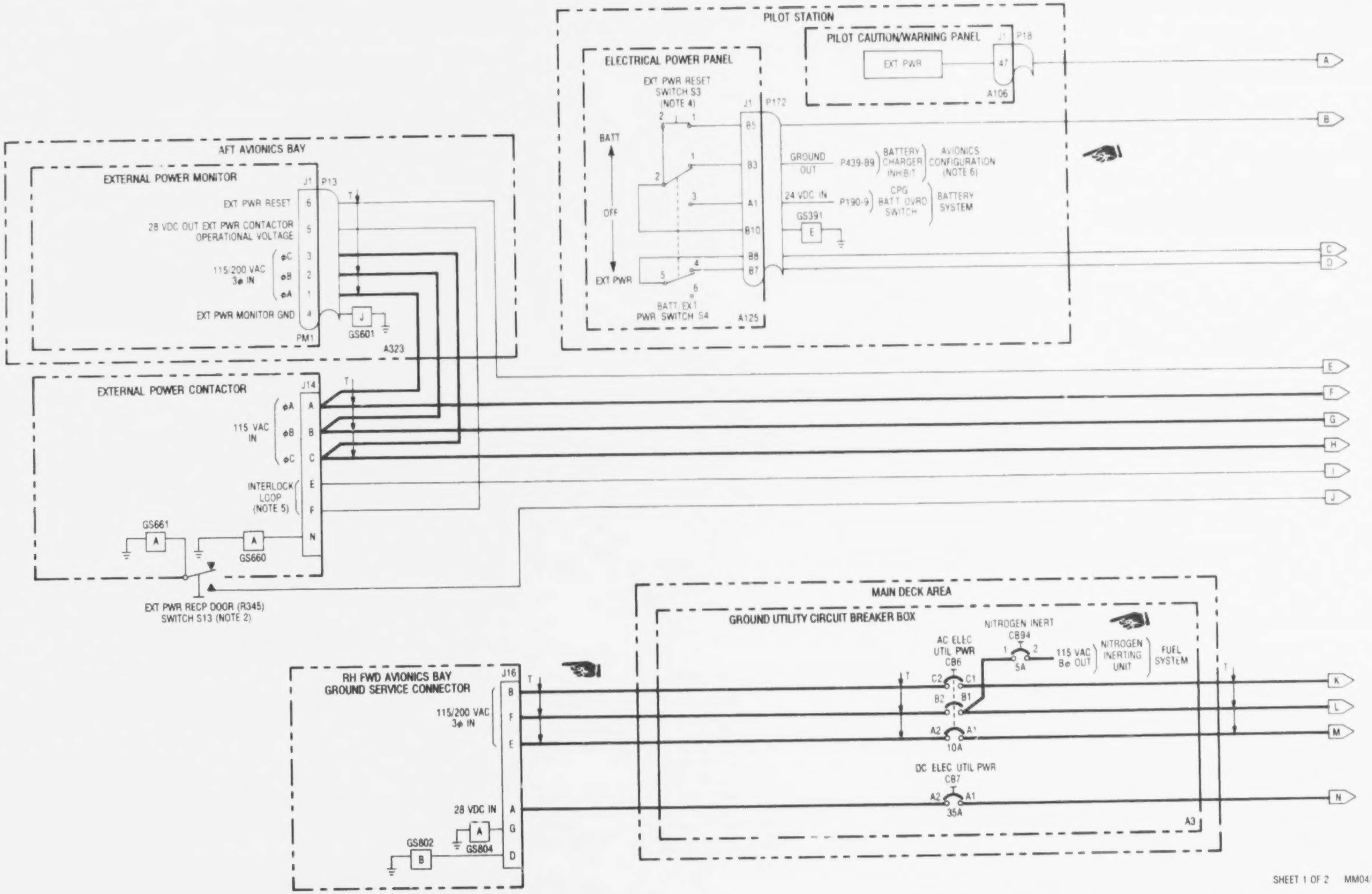


B EXTERNAL POWER RECEPTACLE THROUGH DOOR R345

MM04/1-904A

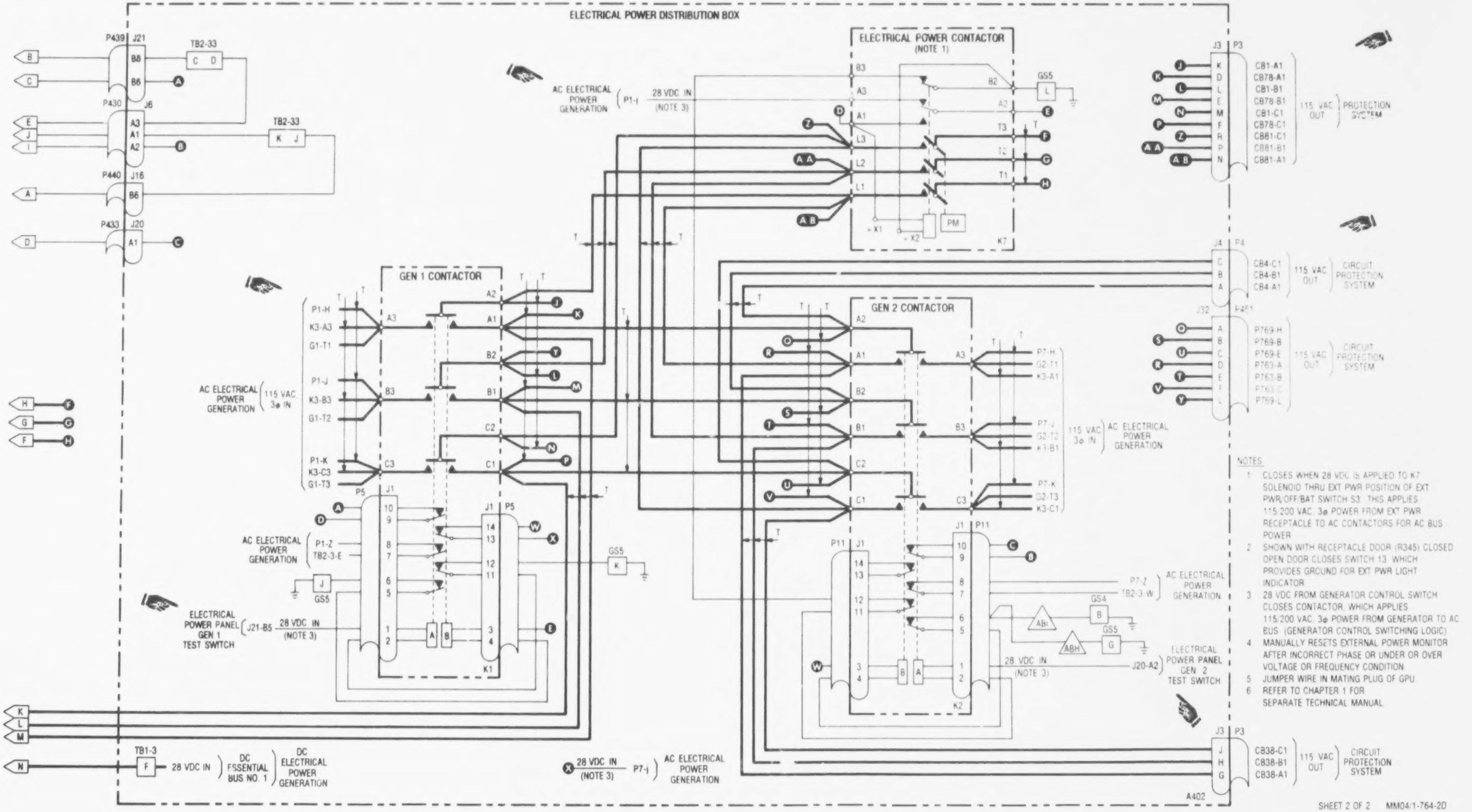
END OF TASK

9-5-4. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - INTERCONNECTION DIAGRAM (cont)



SHEET 1 OF 2 MM04/1-764-10

9-5-4. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR – INTERCONNECTION DIAGRAM (cont)

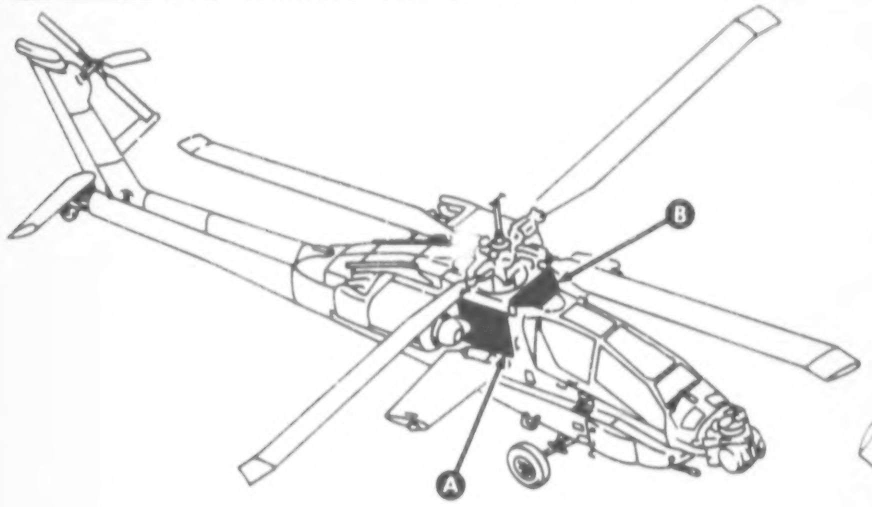


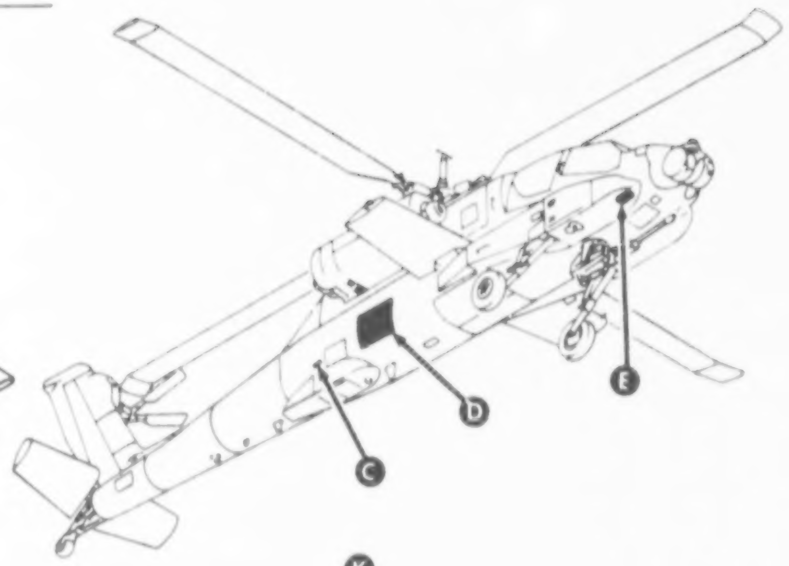
NOTES

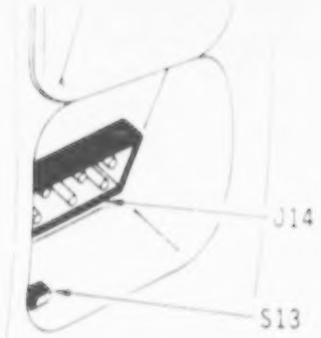
1. CLOSES WHEN 28 VDC IS APPLIED TO K7 SOLENOID THRU EXT PWR POSITION OF EXT PWR/OFF/BAT SWITCH S3. THIS APPLIES 115/200 VAC, 3ϕ POWER FROM EXT PWR RECEPTACLE TO AC CONTACTORS FOR AC BUS POWER
2. SHOWN WITH RECEPTACLE DOOR (R345) CLOSED. OPEN DOOR CLOSES SWITCH 13, WHICH PROVIDES GROUND FOR EXT PWR LIGHT INDICATOR
3. 28 VDC FROM GENERATOR CONTROL SWITCH CLOSES CONTACTOR, WHICH APPLIES 115/200 VAC, 3ϕ POWER FROM GENERATOR TO AC BUS. (GENERATOR CONTROL SWITCHING LOGIC)
4. MANUALLY RESETS EXTERNAL POWER MONITOR AFTER INCORRECT PHASE OR UNDER OR OVER VOLTAGE OR FREQUENCY CONDITION
5. JUMPER WIRE IN MATING PLUG OF GPU
6. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL

SHEET 2 OF 2 MM04/1-764-2D

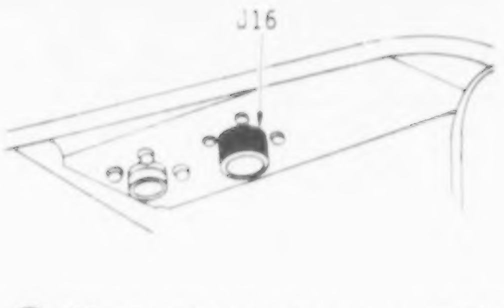
9-5-5. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



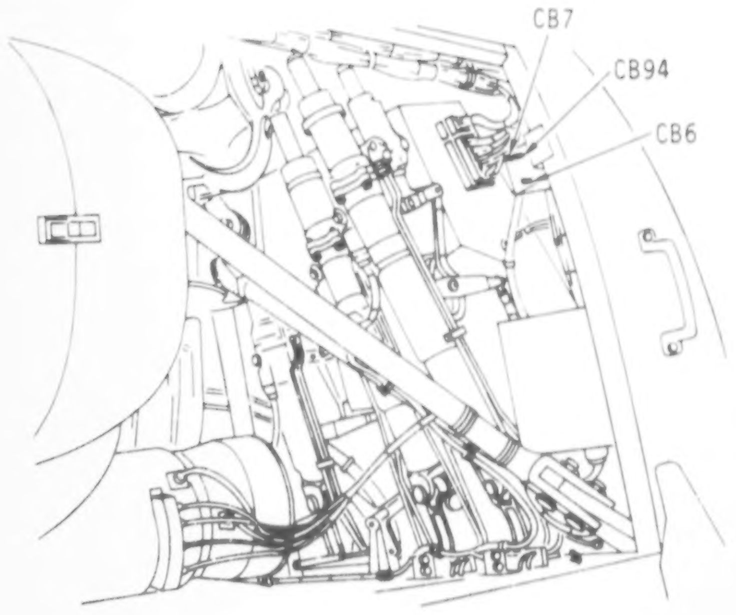




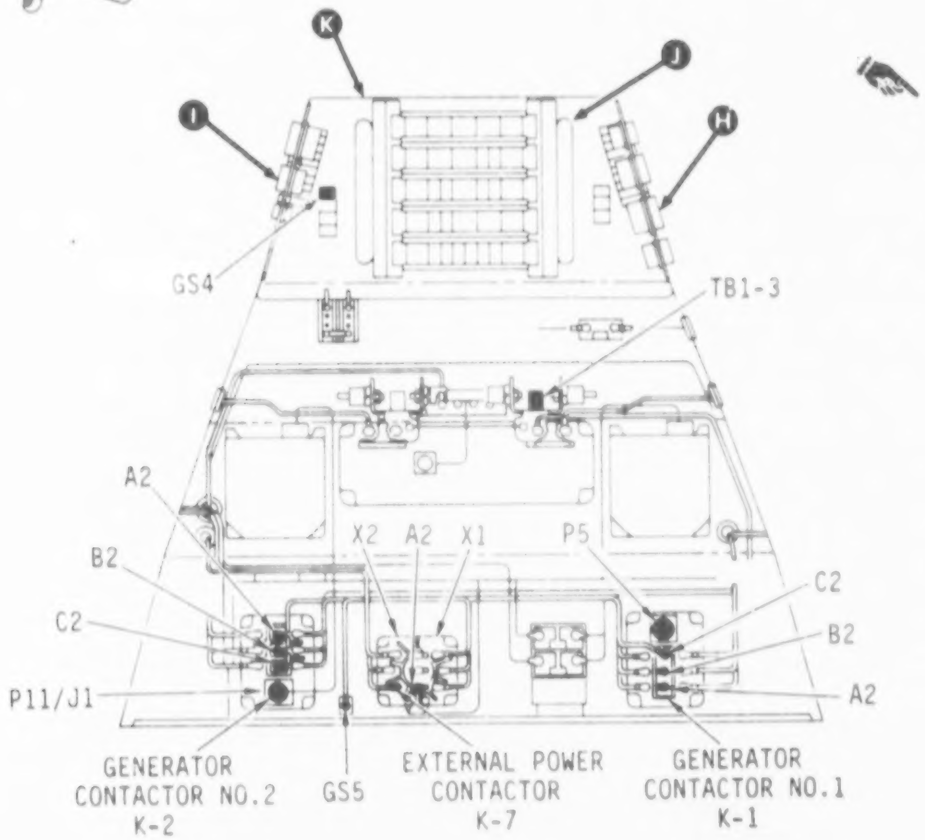
C EXTERNAL POWER CONNECTOR THROUGH DOOR R345



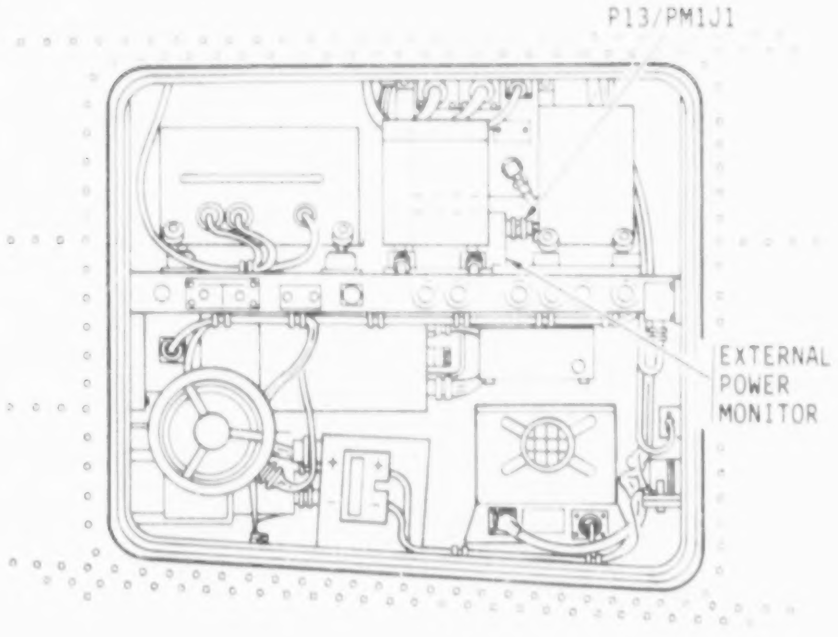
E GROUND SERVICE UTILITY CONNECTOR THROUGH DOOR B60R



A MAIN DECK THROUGH ACCESS PANEL R200


K
J
I
H
GS4
TB1-3
A2
B2
C2
P11/J1
X2
A2
X1
P5
C2
B2
A2
GENERATOR CONTACTOR NO.2 K-2
GS5
EXTERNAL POWER CONTACTOR K-7
GENERATOR CONTACTOR NO.1 K-1

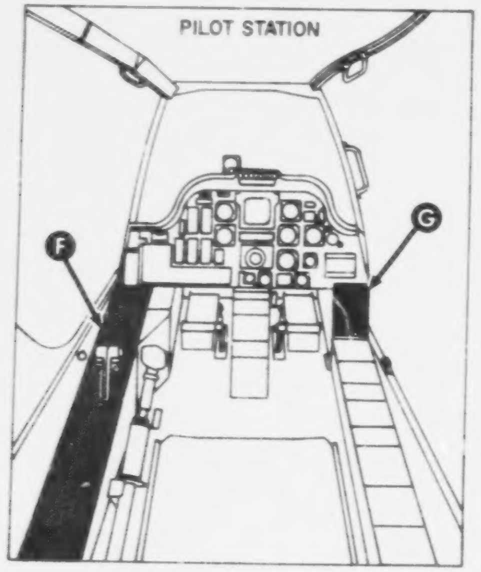
B ELECTRICAL POWER DISTRIBUTION BOX (AFT VIEW)

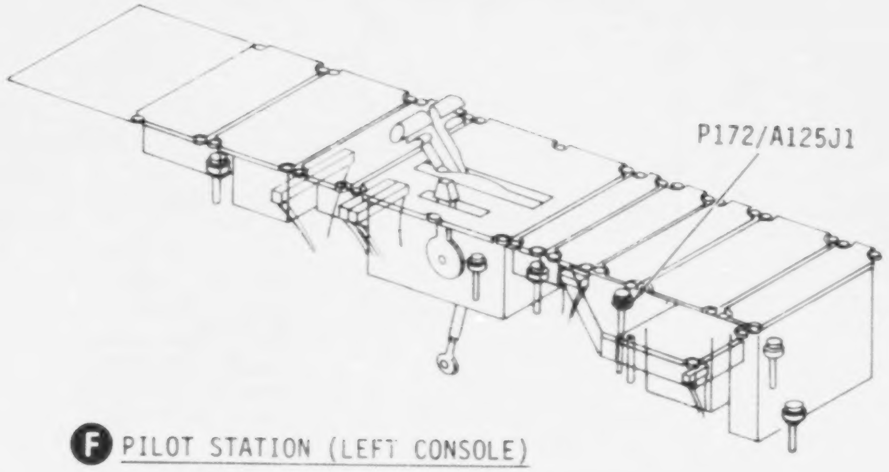


D AFT AVIONICS BAY THROUGH DOOR R295

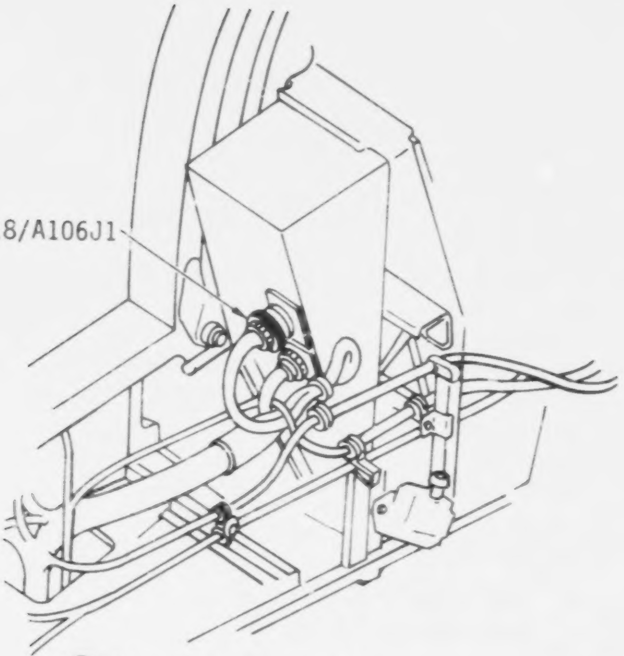
MM04/1-864-1D

9-5-5. EXTERNAL POWER AND GROUND SERVICE UTILITY CONNECTOR - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

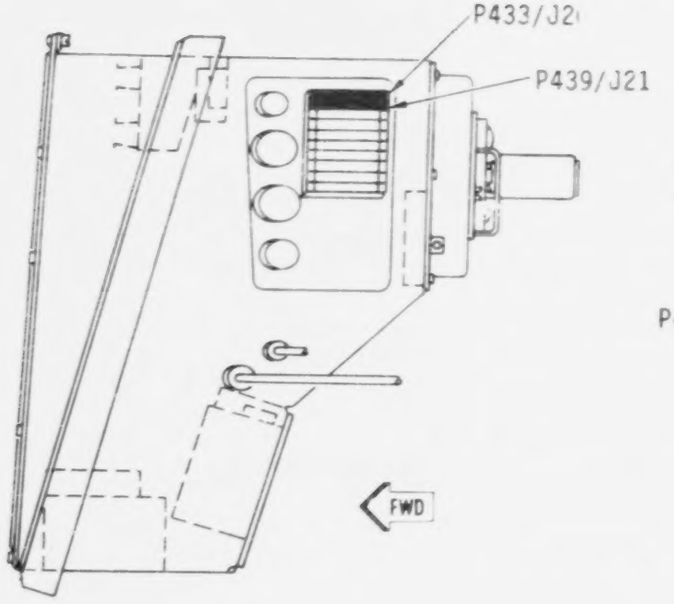




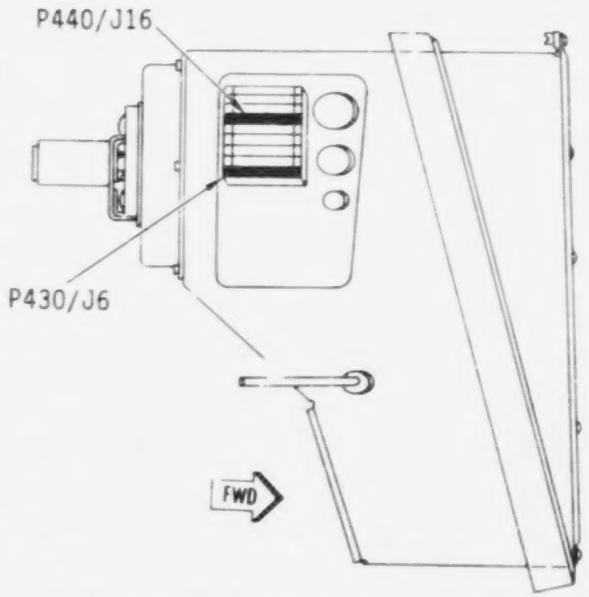
F PILOT STATION (LEFT CONSOLE)



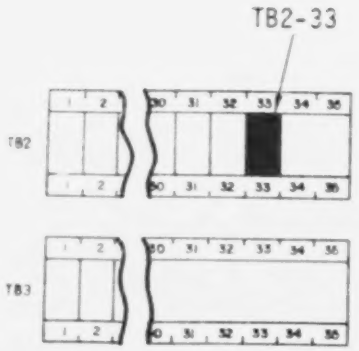
G PILOT RIGHT CONSOLE



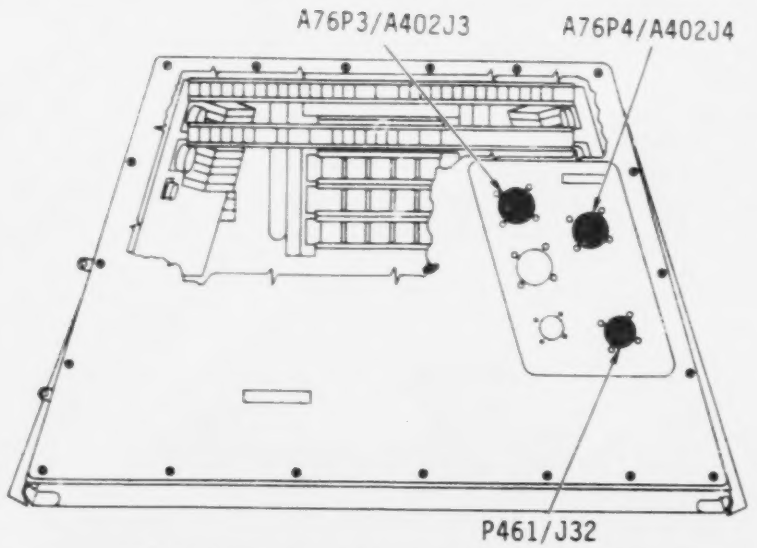
H ELECTRICAL POWER DISTRIBUTION BOX



I ELECTRICAL POWER DISTRIBUTION BOX



J ELECTRICAL POWER DISTRIBUTION BOX TERMINAL BOARD



K ELECTRICAL POWER DISTRIBUTION BOX (AFT VIEW)

MM04/1-864-2D

best copy available

Reproduced from poor document.

9-5-6. EXTERNAL POWER - DOES NOT COME THROUGH EXTERNAL POWER CONTACTOR

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282
Key, Socket Head Screw 7/64 in. Wrenching Size	5120-00-889-2162
Socket, Socket Wrench 3/8 in. drive, 5/8 in. Wrenching Size	5120-00-935-7414

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

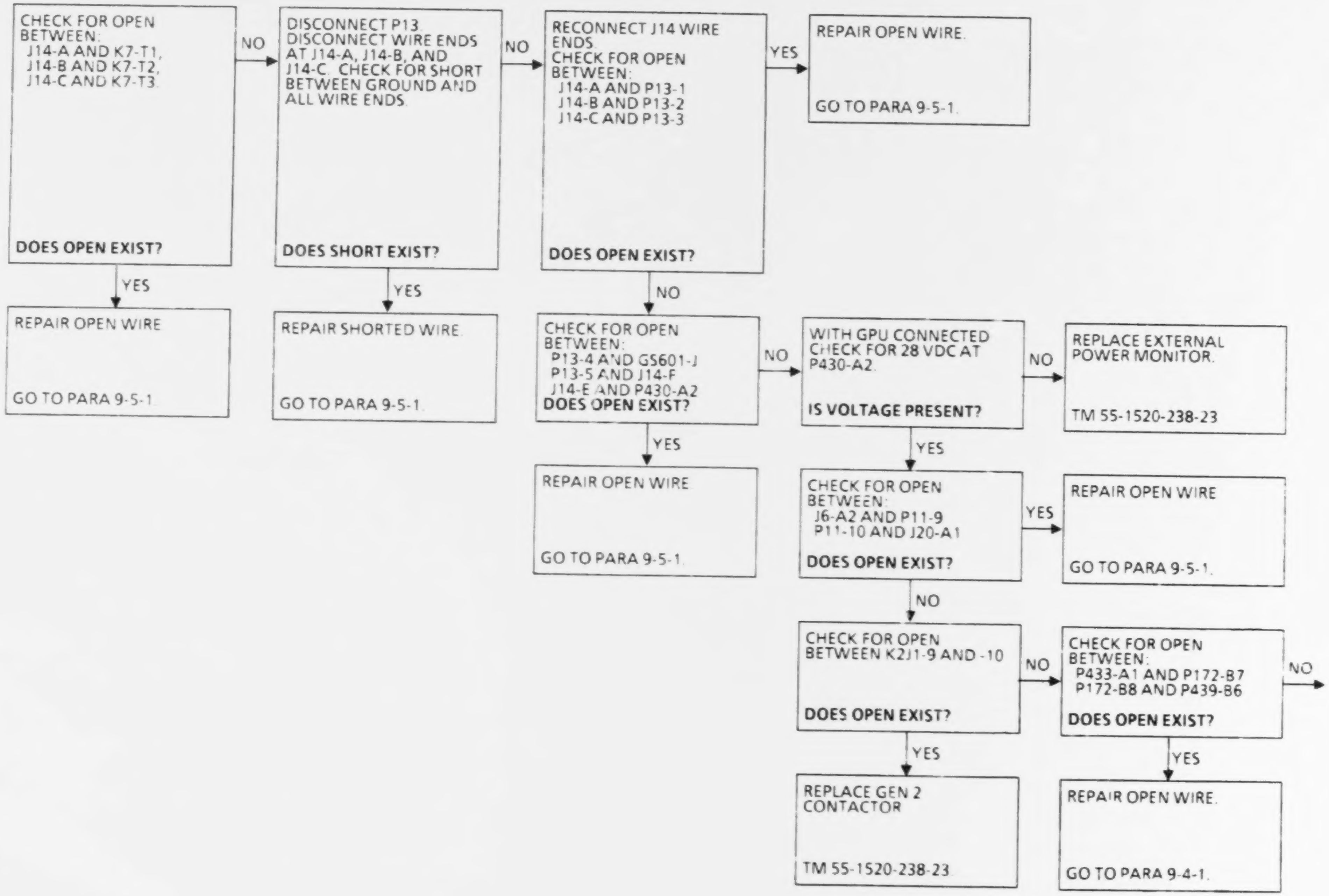
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
■Para 1-3-2	ICS connected
Para 9-5-2	EXTERNAL POWER - POWER UP completed

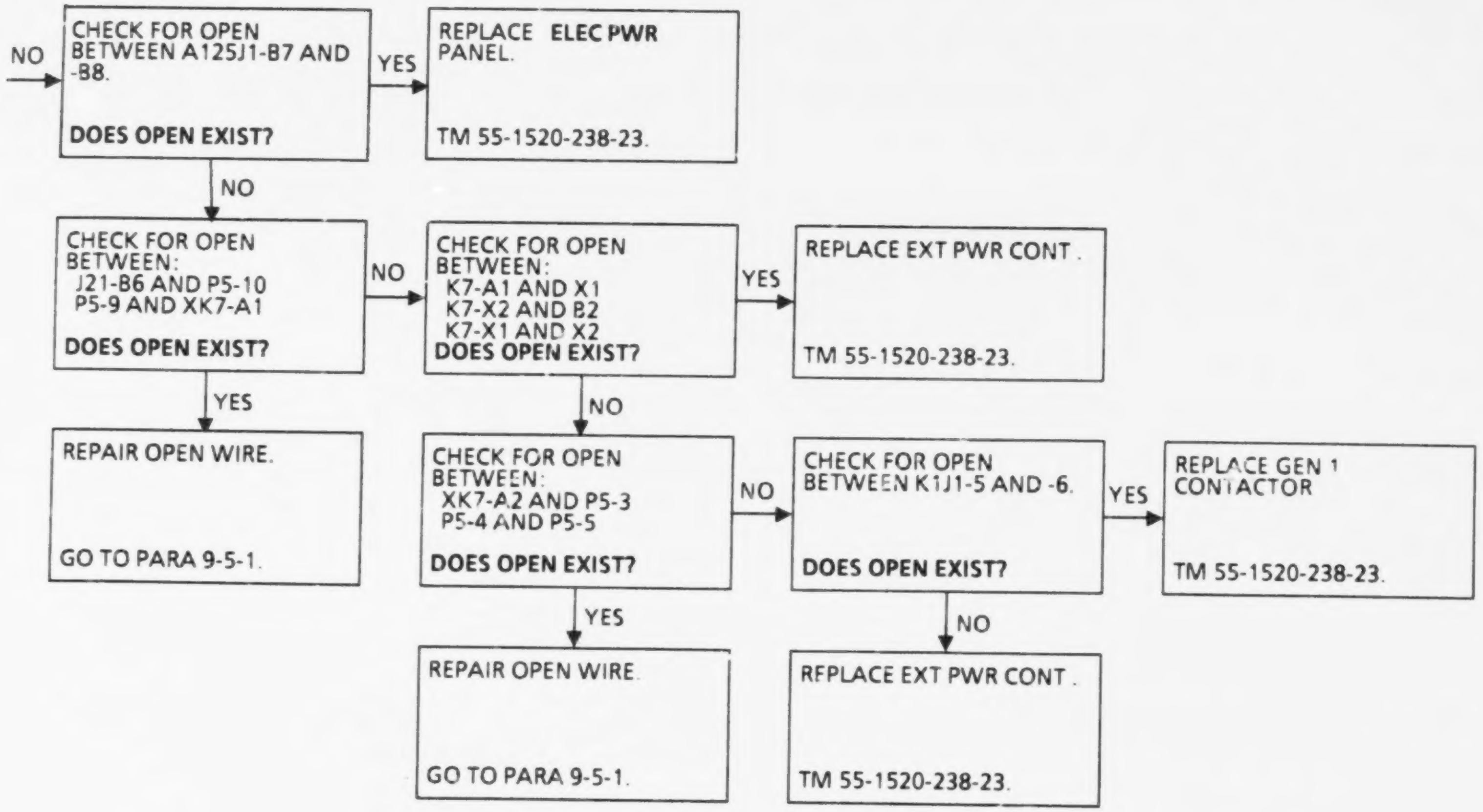
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPEN BETWEEN: J14-A AND K7-T1, J14-B AND K7-T2, J14-C AND K7-T3. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE GO TO PARA 9-5-1
NO
DISCONNECT P13. DISCONNECT WIRE ENDS AT J14-A, J14-B, AND J14-C. CHECK FOR SHORT BETWEEN GROUND AND ALL WIRE ENDS. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-5-1.
NO
RECONNECT J14 WIRE ENDS. CHECK FOR OPEN BETWEEN: J14-A AND P13-1 J14-B AND P13-2 J14-C AND P13-3 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-5-1.
NO
CHECK FOR OPEN BETWEEN: P13-4 AND GS601-J P13-5 AND J14-F J14-E AND P430-A2 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE GO TO PARA 9-5-1.
NO
WITH GPU CONNECTED CHECK FOR 28 VDC AT P430-A2. IS VOLTAGE PRESENT?
NO
REPLACE EXTERNAL POWER MONITOR. TM 55-1520-238-23
YES
CHECK FOR OPEN BETWEEN: J6-A2 AND P11-9 P11-10 AND J20-A1 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE GO TO PARA 9-5-1.
NO
CHECK FOR OPEN BETWEEN K2J1-9 AND -10 DOES OPEN EXIST?
YES
REPLACE GEN 2 CONTACTOR TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: P433-A1 AND P172-B7 P172-B8 AND P439-B6 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-4-1.
NO

GO TO NEXT PAGE.

9-5-6. EXTERNAL POWER - DOES NOT COME THROUGH EXTERNAL POWER CONTACTOR (cont)



END OF TASK

9-5-7. GEN 1 CONTACTOR - DOES NOT CLOSE WITH EXTERNAL POWER APPLIED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

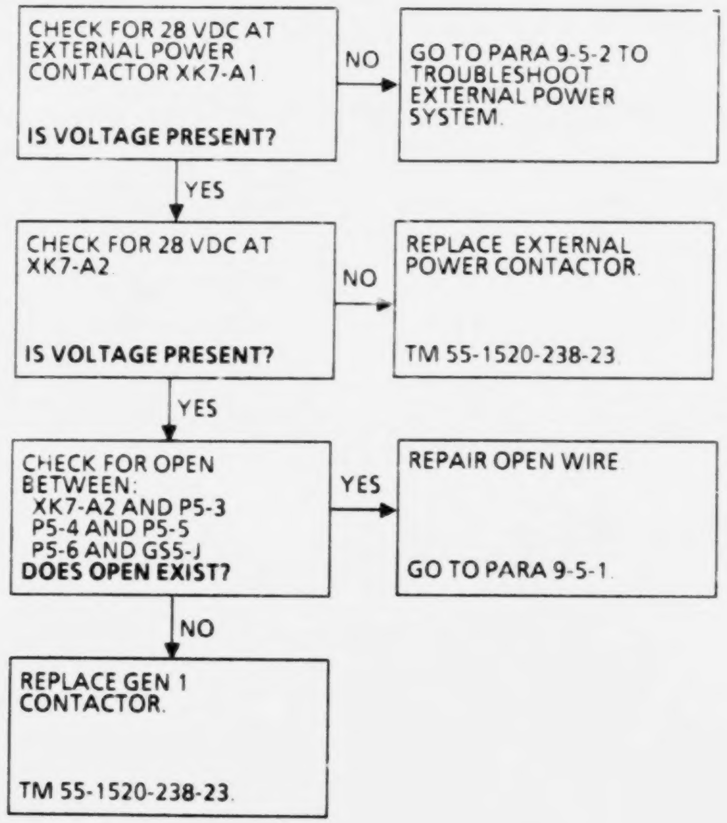
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power distribution box cover removed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-5-8. GROUND UTILITY SERVICE CONNECTOR - DOES NOT HAVE AC POWER

Tools: (para 9-5-7)

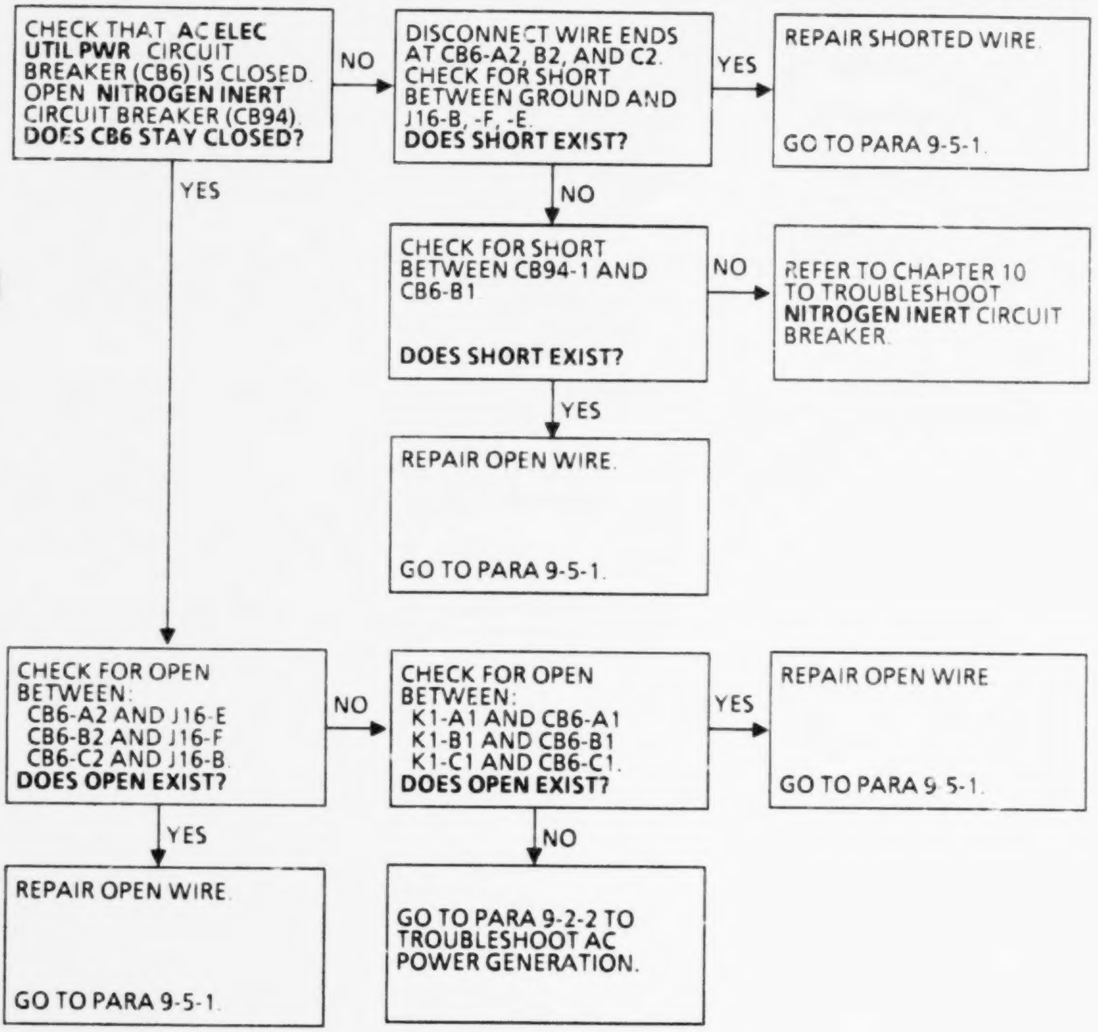
Personnel Required: (para 9-5-7)

References: (para 9-5-7)

Equipment Conditions: (para 9-5-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK THAT AC ELEC UTIL PWR CIRCUIT BREAKER (CB6) IS CLOSED. OPEN NITROGEN INERT CIRCUIT BREAKER (CB94). DOES CB6 STAY CLOSED?
NO
DISCONNECT WIRE ENDS AT CB6-A2, B2, AND C2. CHECK FOR SHORT BETWEEN GROUND AND J16-B, -F, -E.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-5-1.
NO
CHECK FOR SHORT BETWEEN CB94-1 AND CB6-B1.
DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT NITROGEN INERT CIRCUIT BREAKER.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
YES
CHECK FOR OPEN BETWEEN:
CB6-A2 AND J16-E
CB6-B2 AND J16-F
CB6-C2 AND J16-B
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN:
K1-A1 AND CB6-A1
K1-B1 AND CB6-B1
K1-C1 AND CB6-C1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
NO
GO TO PARA 9-2-2 TO TROUBLESHOOT AC POWER GENERATION.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

END OF TASK

9-5-9. GROUND SERVICE UTILITY RECEPTACLE - DOES NOT HAVE DC POWER

Tools: (para 9-5-7)

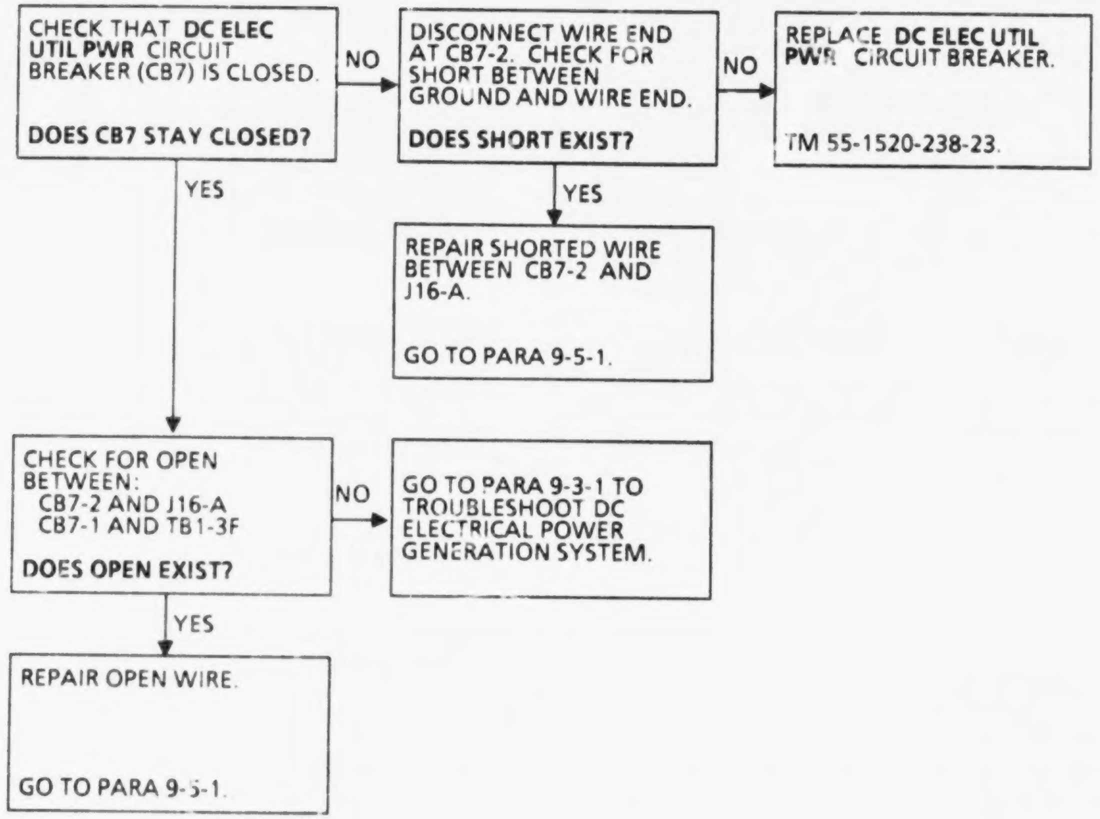
Personnel Required: (para 9-5-7)

References: (para 9-5-7)

Equipment Conditions: (para 9-5-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK THAT **DC ELEC UTIL PWR** CIRCUIT BREAKER (CB7) IS CLOSED.
DOES CB7 STAY CLOSED?

DISCONNECT WIRE END AT CB7-2. CHECK FOR SHORT BETWEEN GROUND AND WIRE END.
DOES SHORT EXIST?

REPLACE **DC ELEC UTIL PWR** CIRCUIT BREAKER.
TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN CB7-2 AND J16-A.
GO TO PARA 9-5-1.

CHECK FOR OPEN BETWEEN:
CB7-2 AND J16-A
CB7-1 AND TB1-3F
DOES OPEN EXIST?

GO TO PARA 9-3-1 TO TROUBLESHOOT DC ELECTRICAL POWER GENERATION SYSTEM.

REPAIR OPEN WIRE.
GO TO PARA 9-5-1.

END OF TASK

9-5-10. EXT PWR INDICATOR - IS NOT LIGHTED WHEN EXTERNAL POWER ACCESS DOOR IS OPEN

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

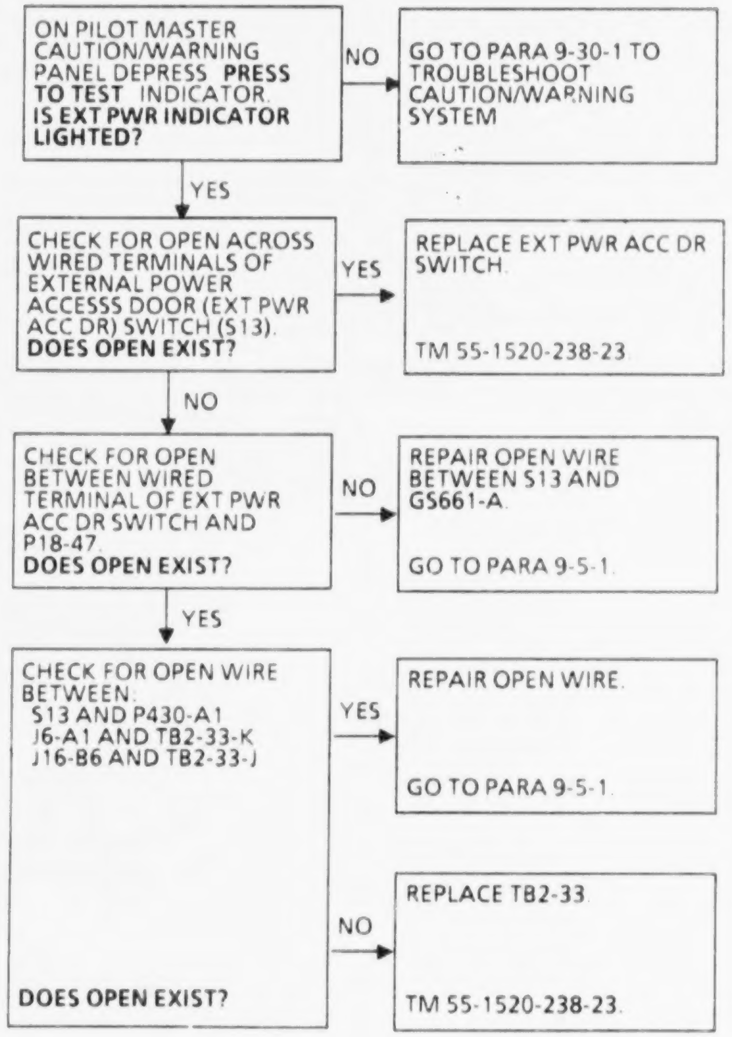
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT MASTER CAUTION/WARNING PANEL DEPRESS PRESS TO TEST INDICATOR. IS EXT PWR INDICATOR LIGHTED?
NO
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM
YES
CHECK FOR OPEN ACROSS WIRED TERMINALS OF EXTERNAL POWER ACCESSS DOOR (EXT PWR ACC DR) SWITCH (S13). DOES OPEN EXIST?
YES
REPLACE EXT PWR ACC DR SWITCH.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN WIRED TERMINAL OF EXT PWR ACC DR SWITCH AND P18-47. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN S13 AND GS661-A.
GO TO PARA 9-5-1.
YES
CHECK FOR OPEN WIRE BETWEEN: S13 AND P430-A1 J6-A1 AND TB2-33-K J16-B6 AND TB2-33-J
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-5-1.
NO
REPLACE TB2-33.
TM 55-1520-238-23.

END OF TASK

9-5-11. EXT PWR INDICATOR - IS LIGHTED WHEN EXTERNAL POWER ACCESS DOOR IS CLOSED

Tools: (para 9-5-10)

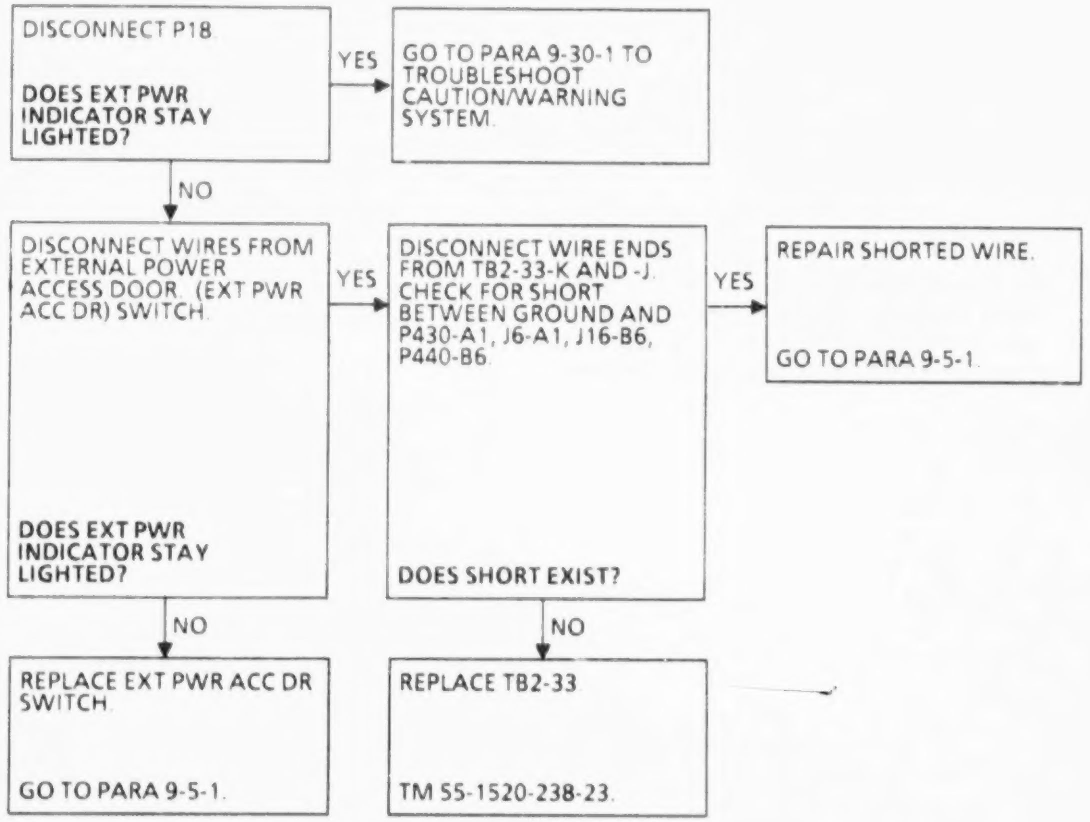
Personnel Required: (para 9-5-10)

References: (para 9-5-10)

Equipment Conditions: (para 9-5-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P18.
DOES EXT PWR INDICATOR STAY LIGHTED?
YES
GO TO PARA 9-30-1 TO TROUBLESHOOT CAUTION/WARNING SYSTEM.
NO
DISCONNECT WIRES FROM EXTERNAL POWER ACCESS DOOR (EXT PWR ACC DR) SWITCH.
DOES EXT PWR INDICATOR STAY LIGHTED?
YES
DISCONNECT WIRE ENDS FROM TB2-33-K AND -J. CHECK FOR SHORT BETWEEN GROUND AND P430-A1, J6-A1, J16-B6, P440-B6.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-5-1.
NO
REPLACE EXT PWR ACC DR SWITCH.
GO TO PARA 9-5-1.
NO
REPLACE TB2-33.
TM 55-1520-238-23.

END OF TAS

9-5-12. ELECTRICAL POWER DOES NOT COME ON AFTER EXT PWR RESET BUTTON HAS BEEN DEPRESSED

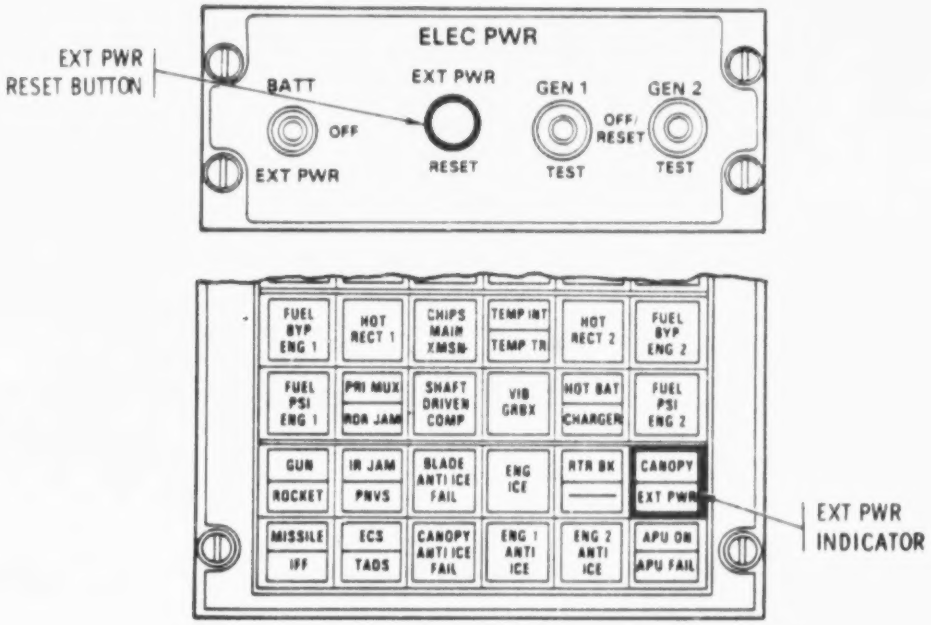
Tools: (para 9-5-10)

Personnel Required: (para 9-5-10)

References: (para 9-5-10)

Equipment Conditions:

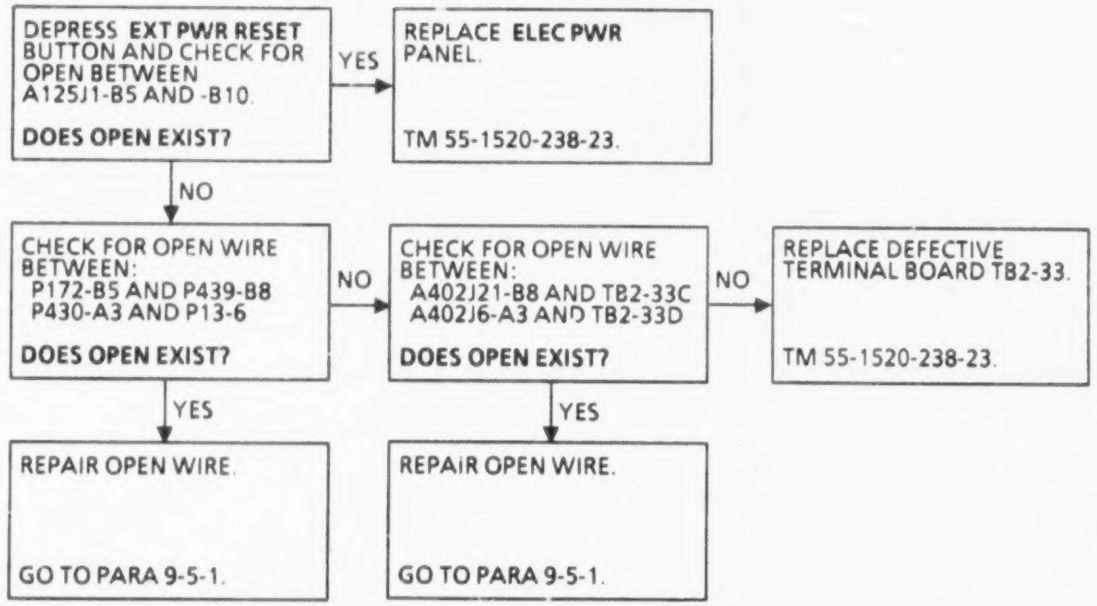
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	EXT PWR panel - removed



MH04/1-1316

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DEPRESS **EXT PWR RESET** BUTTON AND CHECK FOR OPEN BETWEEN A125J1-B5 AND -B10.

DOES OPEN EXIST?

YES: REPLACE **ELEC PWR** PANEL. TM 55-1520-238-23.

NO: CHECK FOR OPEN WIRE BETWEEN: P172-B5 AND P439-B8; P430-A3 AND P13-6

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-5-1.

NO: CHECK FOR OPEN WIRE BETWEEN: A402J21-B8 AND TB2-33C; A402J6-A3 AND TB2-33D

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-5-1.

NO: REPLACE DEFECTIVE TERMINAL BOARD TB2-33. TM 55-1520-238-23.

END OF TASK

9-6-1. NAVIGATION LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

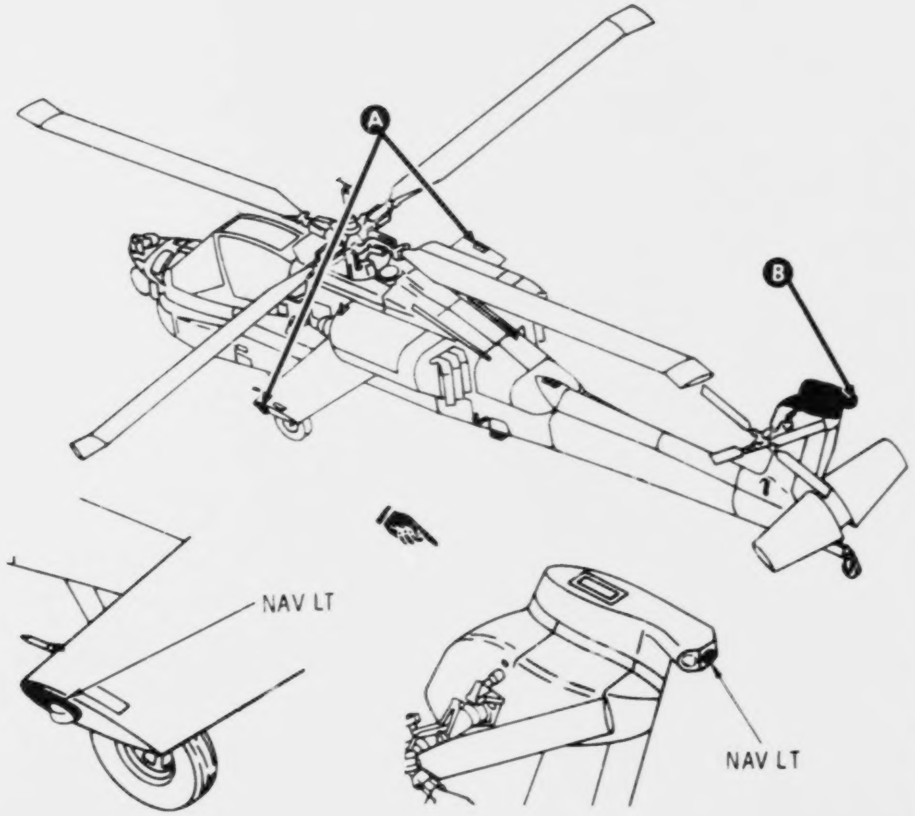
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

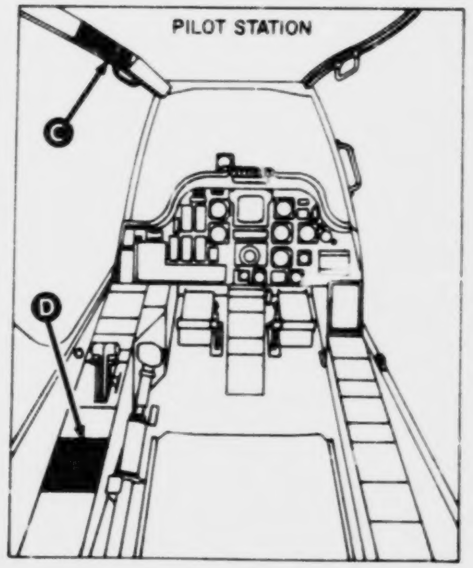
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Navigation lights visual inspection performed
	External power application - Electrical



Ⓐ WING NAVIGATION LIGHTS (TYPICAL)

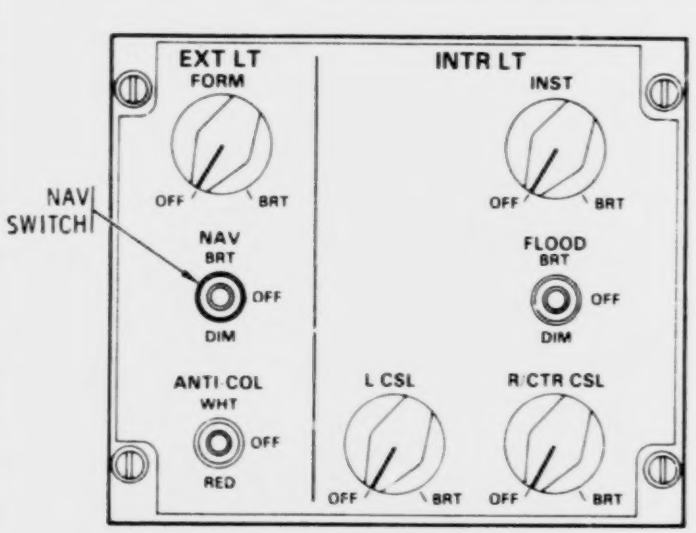
Ⓑ TAIL NAVIGATION LIGHT



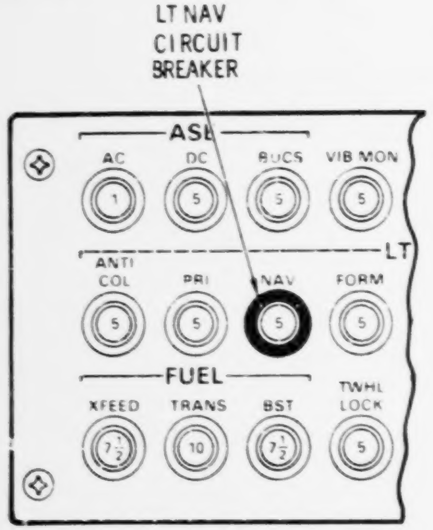
A. Perform operational check as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that **LT NAV** circuit breaker is closed.	If **LT NAV** circuit breaker does not stay closed, go to para 9-6-5.
2. On **EXT LT/INTR LT** panel, set **NAV** switch to **DIM** position, and then to **BRT** position. Check that left, right, and tail navigation lights function in each position.	If **LT NAV** circuit breaker does not stay closed, go to para 9-6-5. If left, right, and tail navigation lights do not function, go to para 9-6-4. If left navigation light does not function in both positions, go to para 9-6-6. If right navigation light does not function in both positions, go to para 9-6-7. If tail navigation light does not function, go to para 9-6-8.

B. Remove external power - Electrical (TM 55-1520-238-23).



Ⓓ PILOT EXT LT/INTR LT PANEL

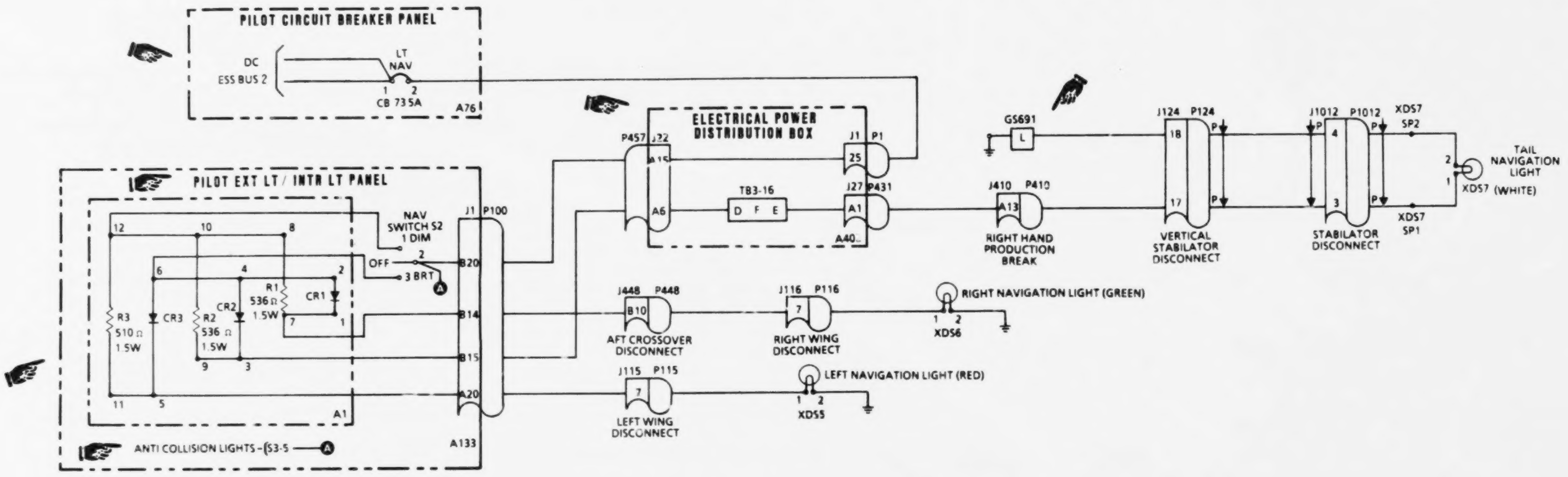


Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1019C

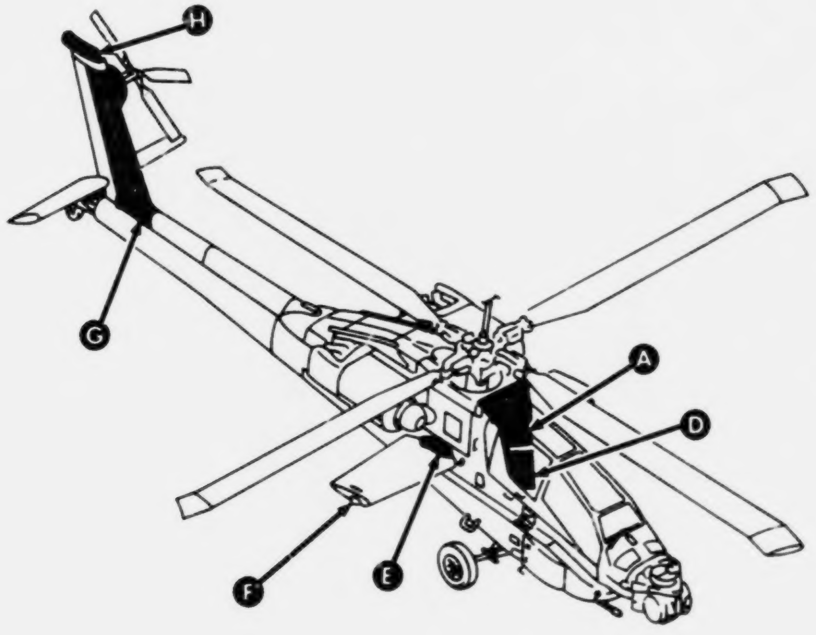
END OF TASK

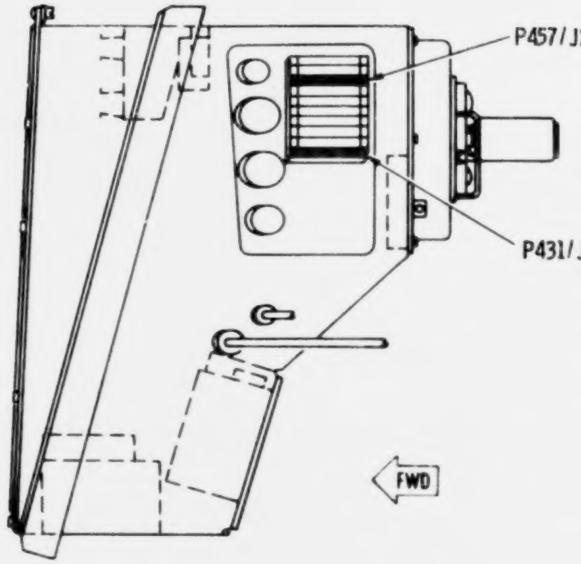
9-6-2. NAVIGATION LIGHTS - INTERCONNECTION DIAGRAM



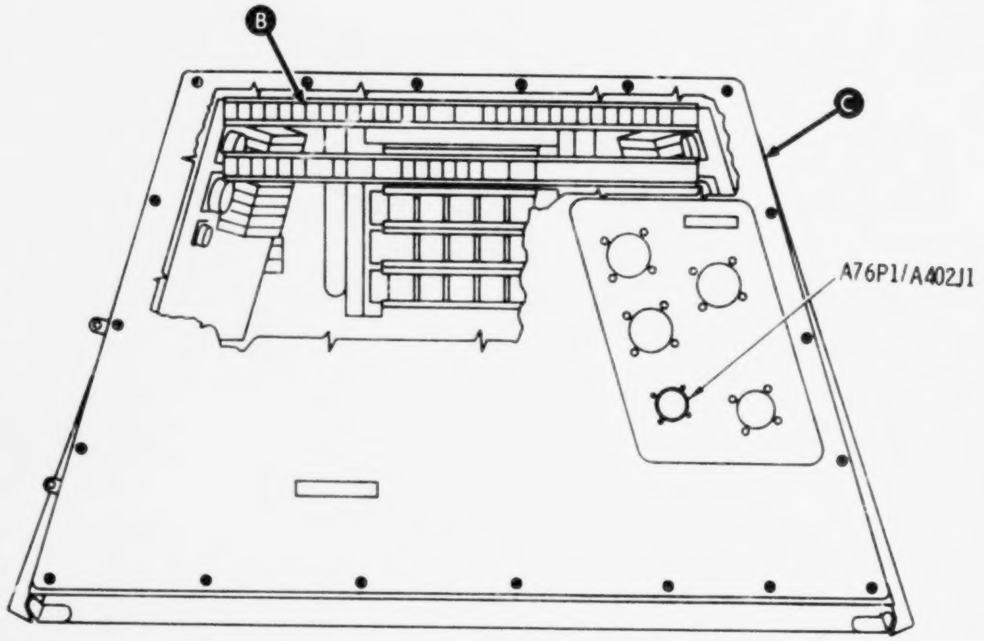
MM04/1-726D

9-6-3. NAVIGATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

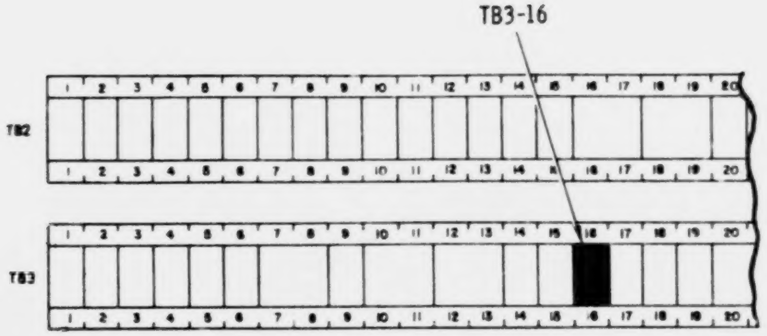




C LEFT SIDE

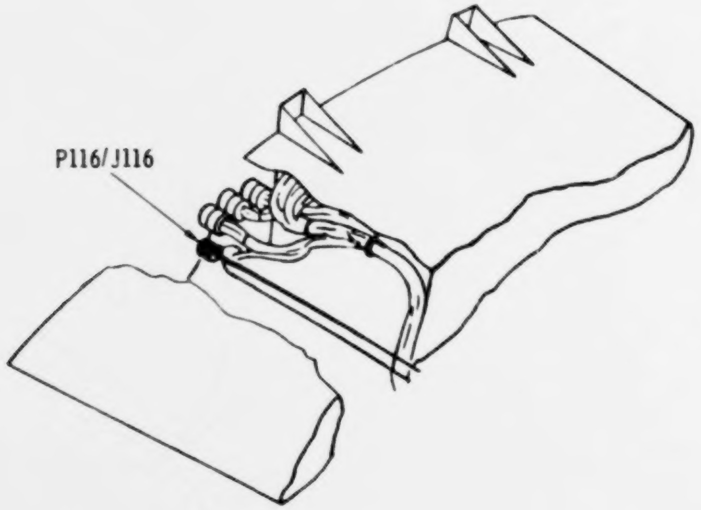


A ELECTRICAL POWER DISTRIBUTION BOX
(AFT VIEW)

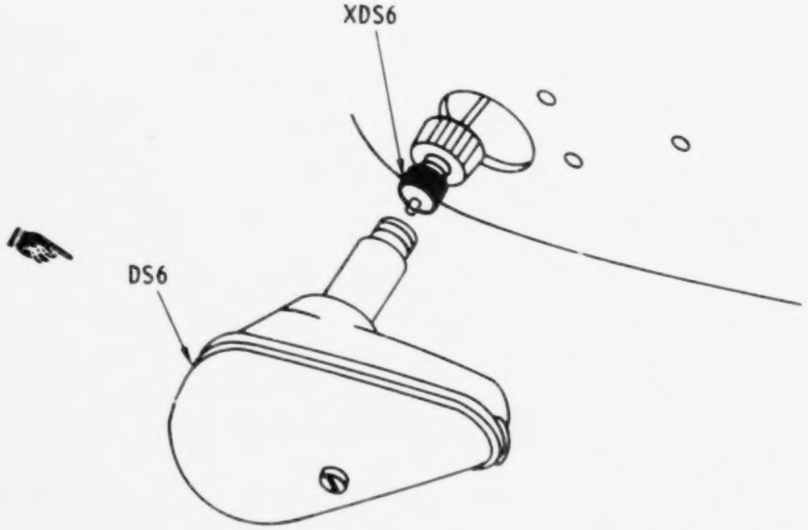


B TERMINAL BOARDS

(AFT VIEW)



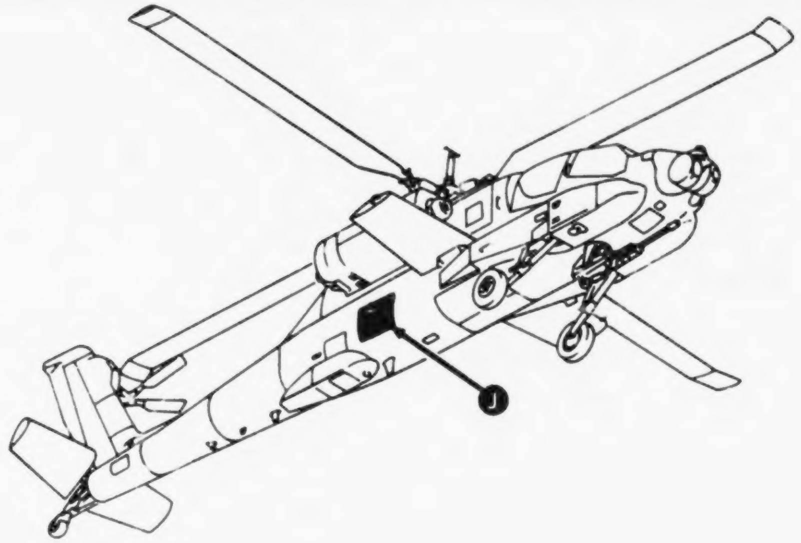
E RIGHT WING THROUGH FAIRING RW10

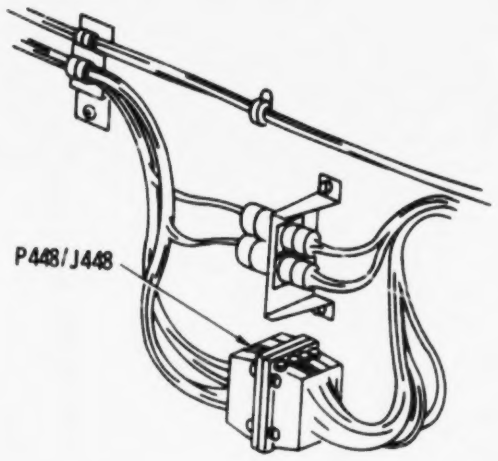


F RIGHT WING TIP NAVIGATION LIGHT
(ROTATED)

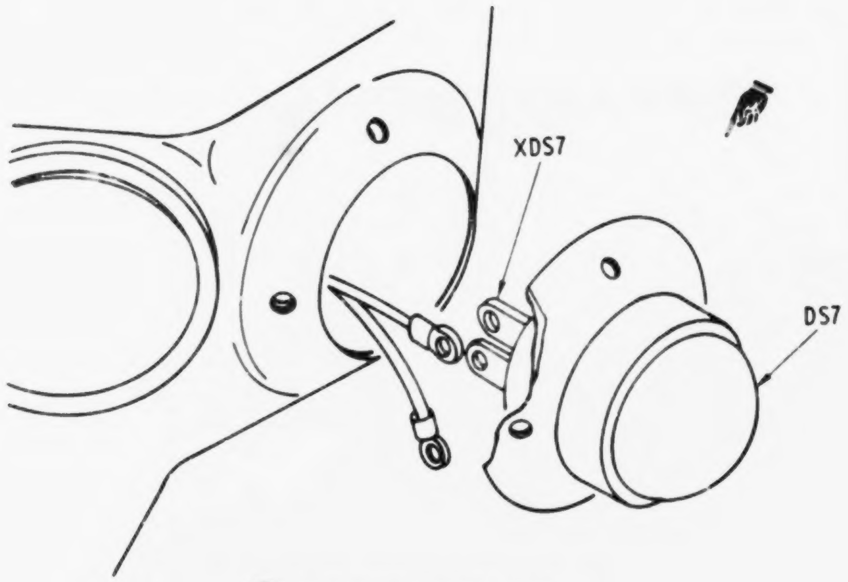
MM04/1-1219-1C

9-6-3. NAVIGATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

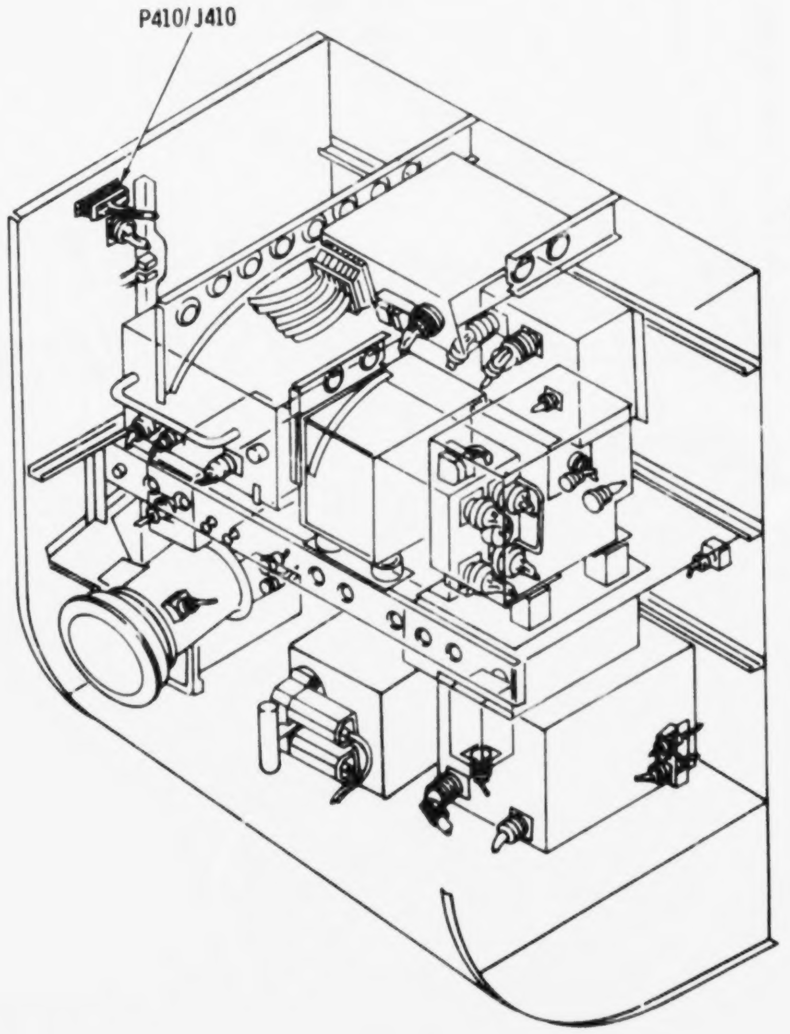




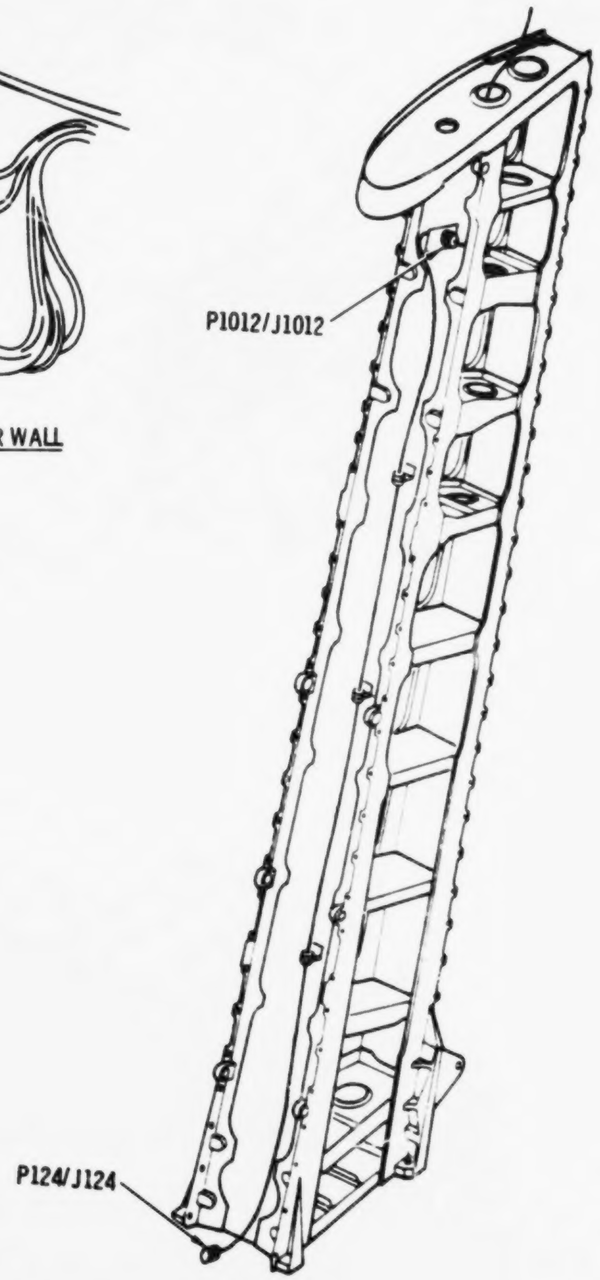
D PILOT STATION REAR WALL



H TAIL NAVIGATION LIGHT



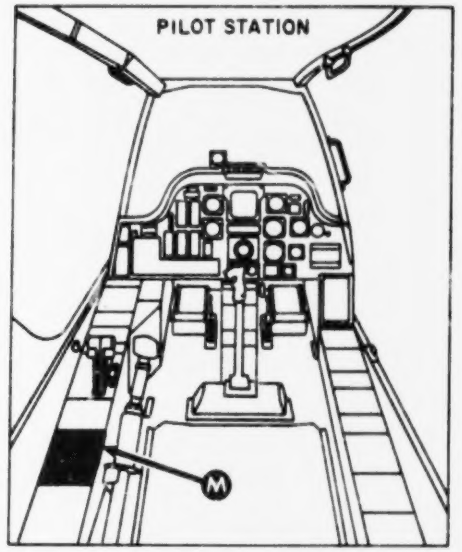
J AFT AVIONICS BAY THROUGH DOOR R295

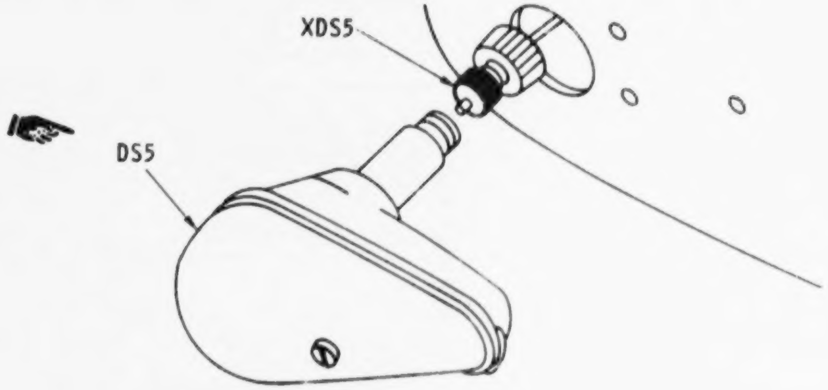


G VERTICAL STABILIZER THROUGH FAIRING T545, L540, AND R510

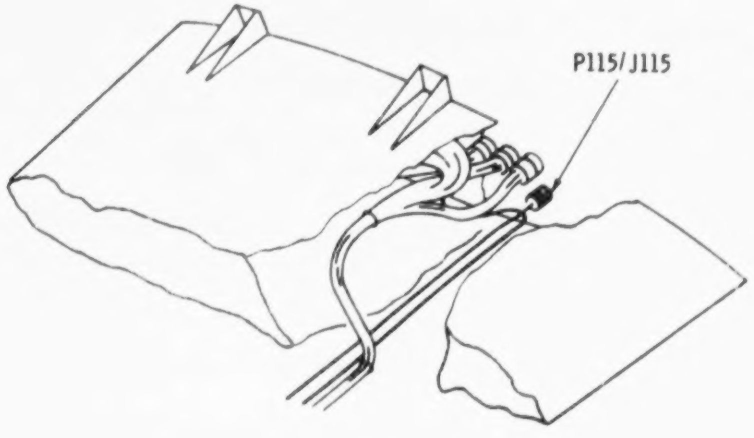
MM04/1-1219-2B

9-6-3. NAVIGATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

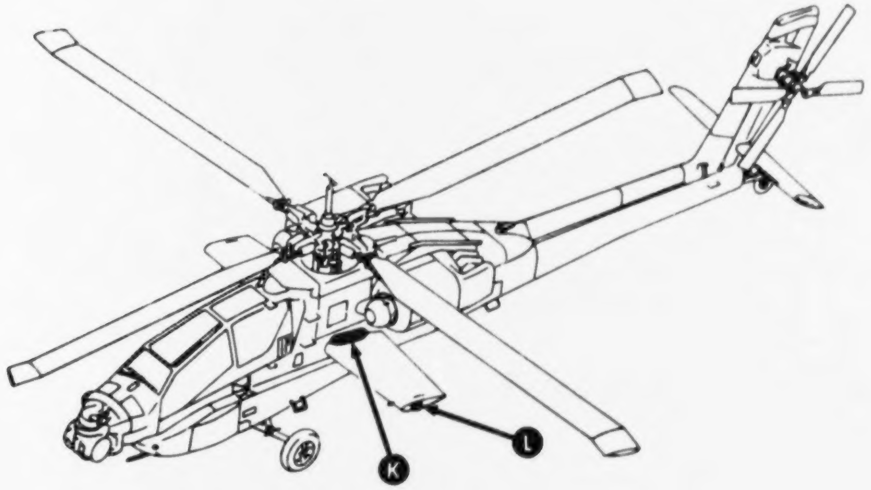


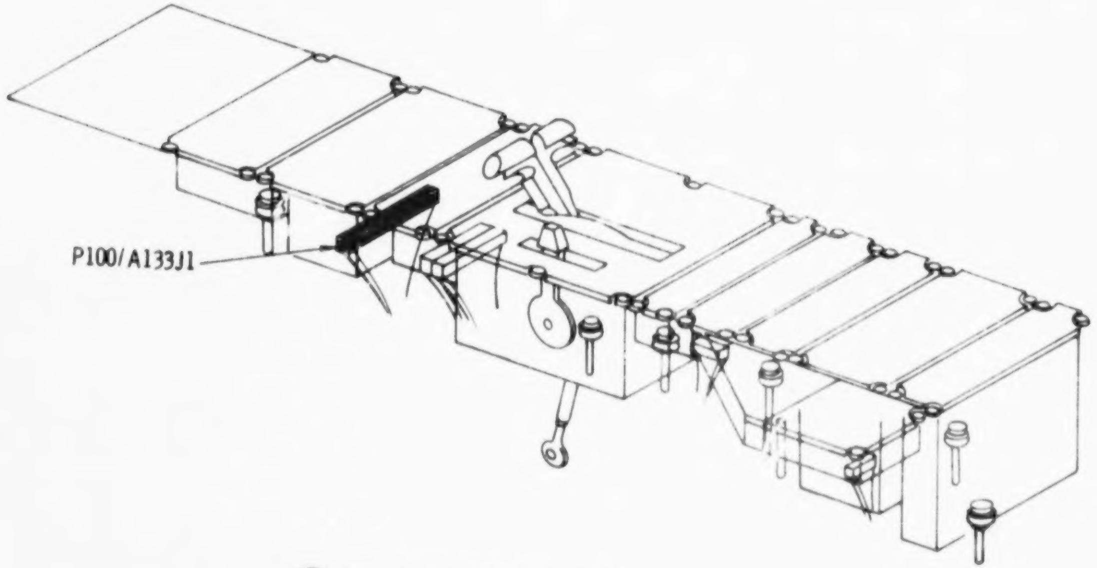


L LEFT WING TIP NAVIGATION LIGHT



K LEFT WING THROUGH FAIRING LW10





M PILOT LEFT SIDE CONSOLE

MM04/1-1219-3C

9-6-4. ALL NAVIGATION LIGHTS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

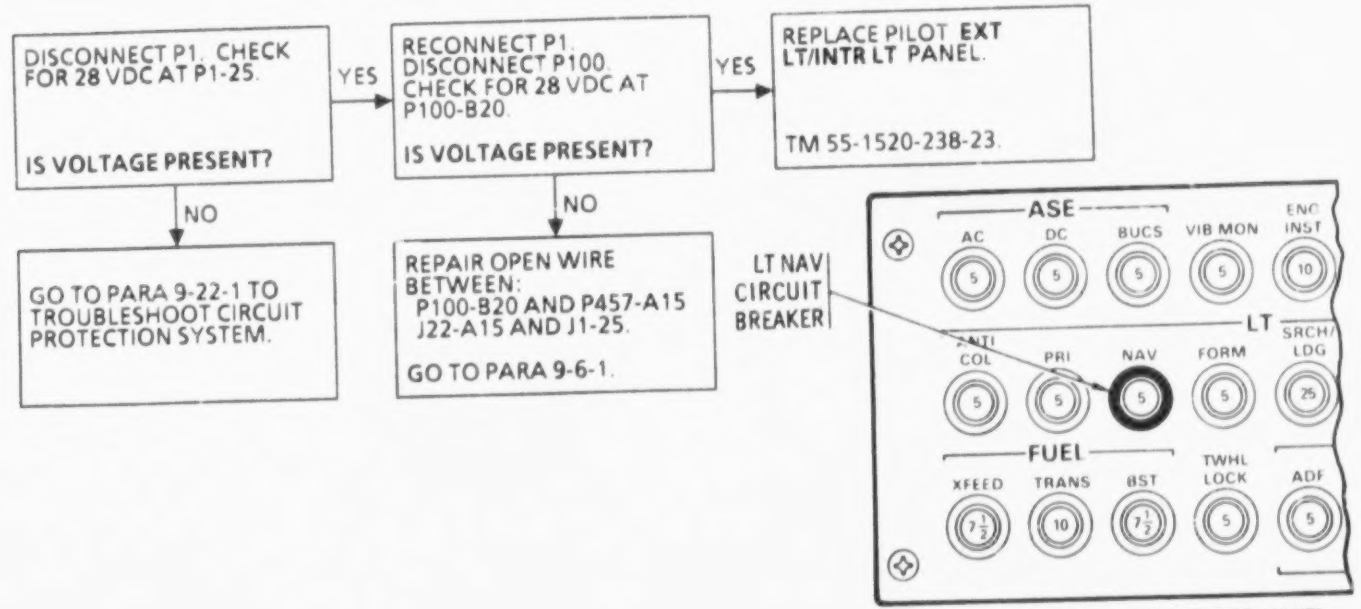
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1359

END OF TASK

9-6-5. LT NAV CIRCUIT BREAKER (CB73) - DOES NOT STAY CLOSED

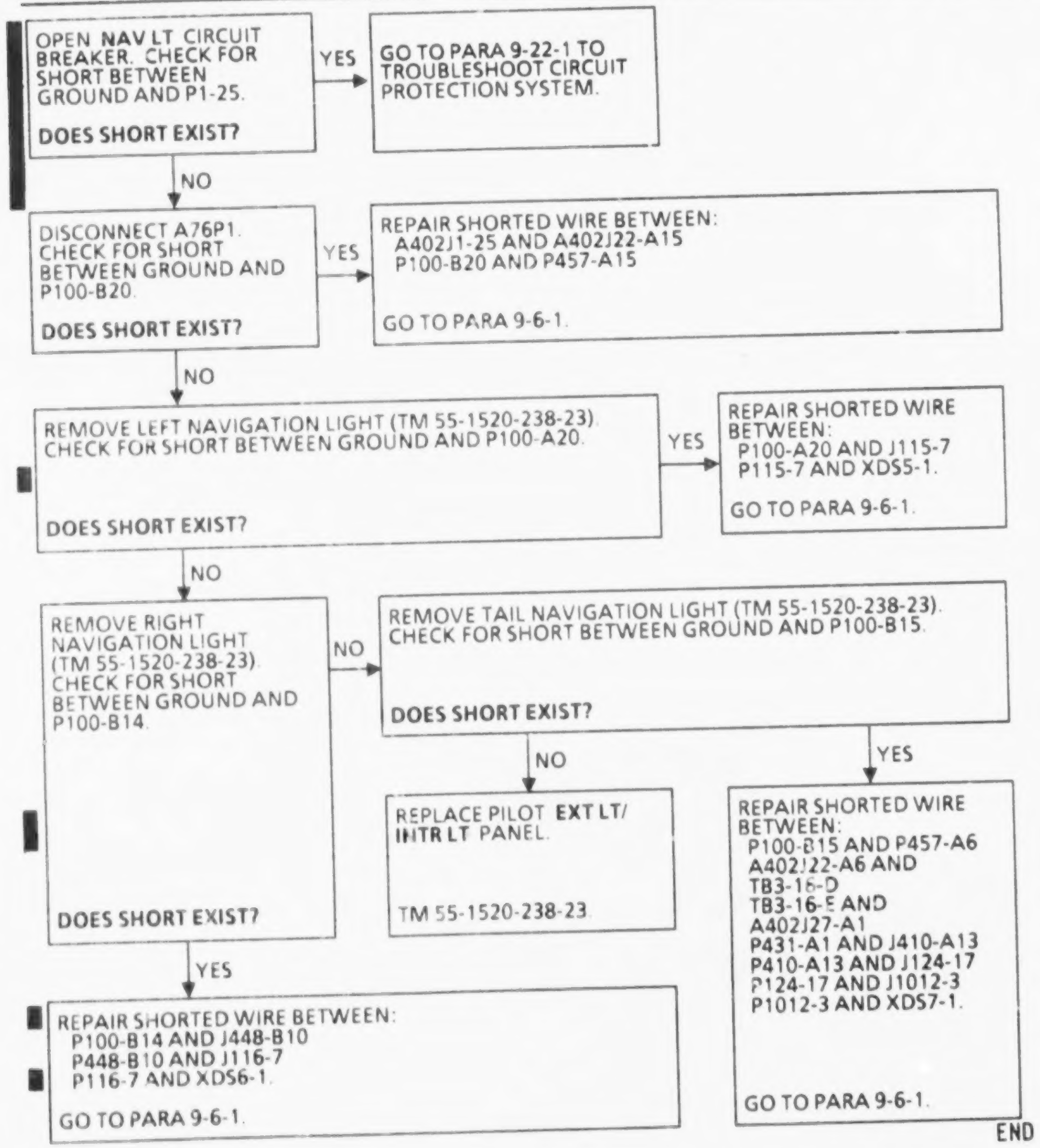
Tools: (para 9-6-4)

Personnel Required: (para 9-6-4)

References: (para 9-6-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN NAV LT CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND P1-25.
DOES SHORT EXIST?
YES
GO TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT A76P1. CHECK FOR SHORT BETWEEN GROUND AND P100-B20.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN:
A402J1-25 AND A402J22-A15
P100-B20 AND P457-A15
GO TO PARA 9-6-1.
NO
REMOVE LEFT NAVIGATION LIGHT (TM 55-1520-238-23). CHECK FOR SHORT BETWEEN GROUND AND P100-A20.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN:
P100-A20 AND J115-7
P115-7 AND XDS5-1.
GO TO PARA 9-6-1.
NO
REMOVE RIGHT NAVIGATION LIGHT (TM 55-1520-238-23). CHECK FOR SHORT BETWEEN GROUND AND P100-B14.
DOES SHORT EXIST?
NO
REMOVE TAIL NAVIGATION LIGHT (TM 55-1520-238-23). CHECK FOR SHORT BETWEEN GROUND AND P100-B15.
DOES SHORT EXIST?
NO
REPLACE PILOT EXT LT/INTR LT PANEL.
TM 55-1520-238-23
YES
REPAIR SHORTED WIRE BETWEEN:
P100-B15 AND P457-A6
A402J22-A6 AND
TB3-16-D
TB3-16-E AND
A402J27-A1
P431-A1 AND J410-A13
P410-A13 AND J124-17
P124-17 AND J1012-3
P1012-3 AND XDS7-1.
GO TO PARA 9-6-1.
YES
REPAIR SHORTED WIRE BETWEEN:
P100-B14 AND J448-B10
P448-B10 AND J116-7
P116-7 AND XDS6-1.
GO TO PARA 9-6-1.

END OF TASK

9-6-6. LEFT NAVIGATION LIGHT - DOES NOT FUNCTION

Tools: (para 9-6-4)

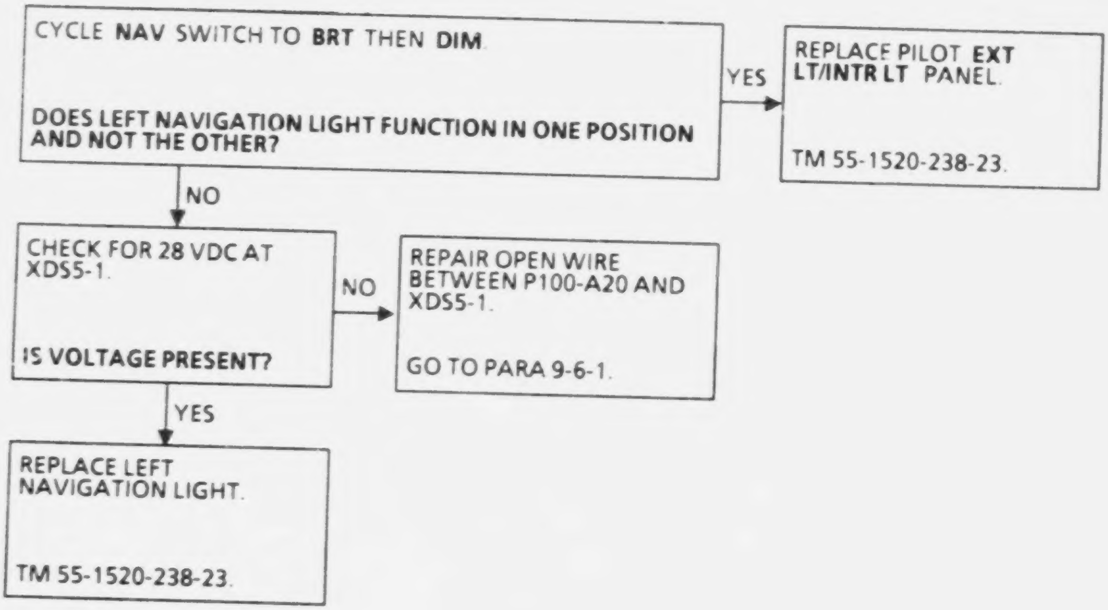
References: (para 9-6-4)

Personnel Required: (para 9-6-4)

Equipment Conditions: (para 9-6-4

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CYCLE **NAV** SWITCH TO **BRT** THEN **DIM**.

DOES LEFT NAVIGATION LIGHT FUNCTION IN ONE POSITION AND NOT THE OTHER?

REPLACE PILOT **EXT LT/INTR LT** PANEL.

TM 55-1520-238-23.

CHECK FOR 28 VDC AT XDS5-1.

IS VOLTAGE PRESENT?

REPAIR OPEN WIRE BETWEEN P100-A20 AND XDS5-1.

GO TO PARA 9-6-1.

REPLACE LEFT NAVIGATION LIGHT.

TM 55-1520-238-23.

END OF TASK

9-6-7. RIGHT NAVIGATION LIGHT - DOES NOT FUNCTION

Tools: (para 9-6-4)

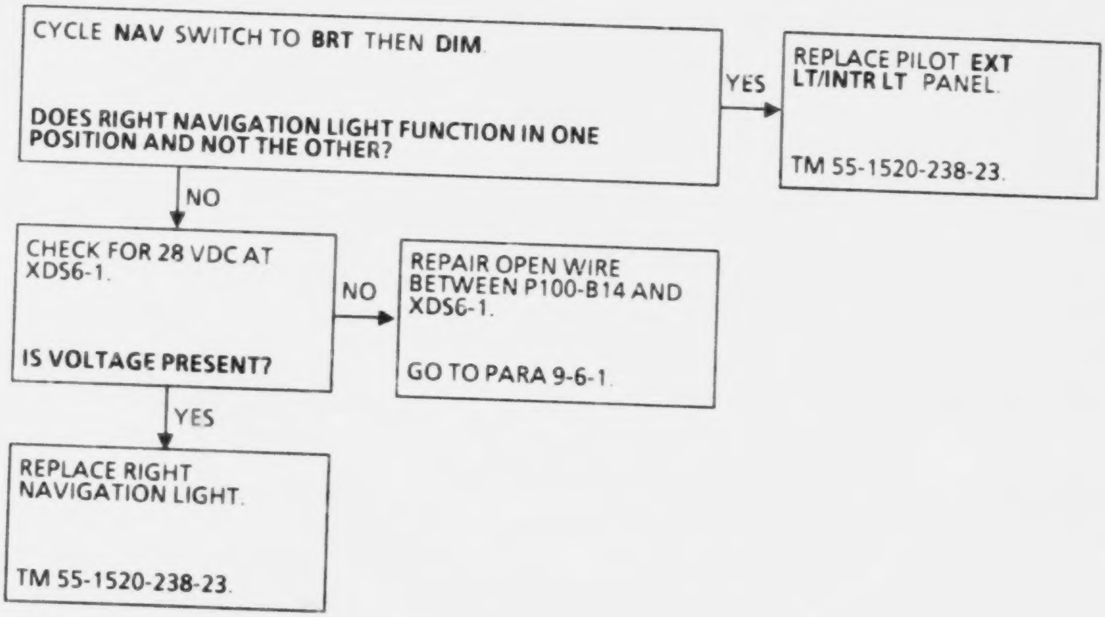
Personnel Required: (para 9-6-4)

References: (para 9-6-4)

Equipment Conditions: (para 9-6-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CYCLE **NAV** SWITCH TO **BRT** THEN **DIM**.

DOES RIGHT NAVIGATION LIGHT FUNCTION IN ONE POSITION AND NOT THE OTHER?

YES: REPLACE PILOT **EXT LT/INTR LT** PANEL.

TM 55-1520-238-23.

NO: CHECK FOR 28 VDC AT XDS6-1.

IS VOLTAGE PRESENT?

NO: REPAIR OPEN WIRE BETWEEN P100-B14 AND XDS6-1.

GO TO PARA 9-6-1.

YES: REPLACE RIGHT NAVIGATION LIGHT.

TM 55-1520-238-23.

END OF TASK

9-6-8. TAIL NAVIGATION LIGHT - DOES NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

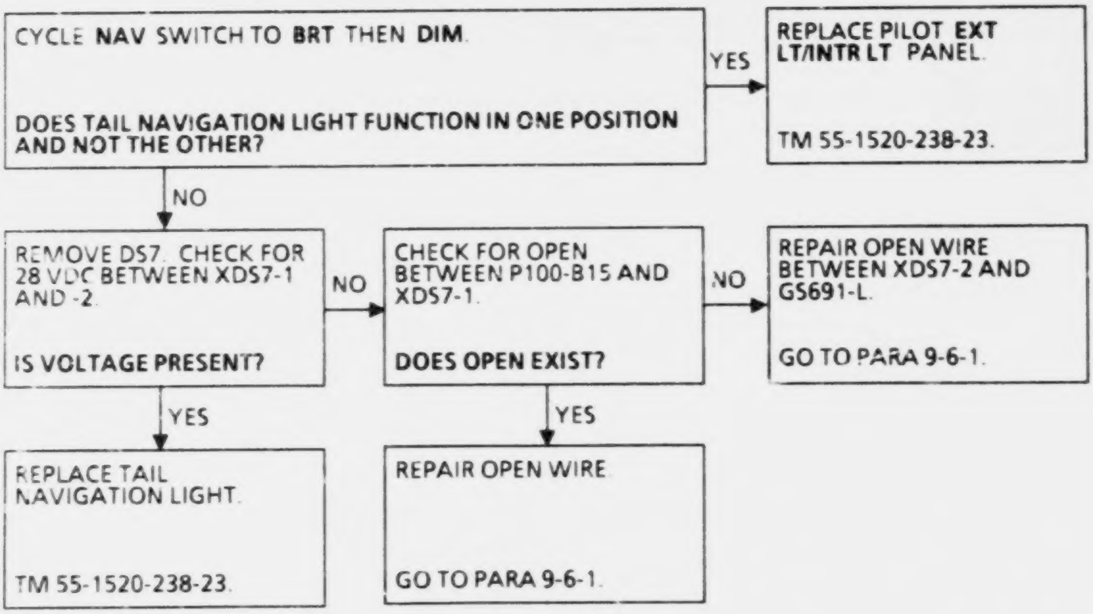
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CYCLE NAV SWITCH TO BRT THEN DIM.

DOES TAIL NAVIGATION LIGHT FUNCTION IN ONE POSITION AND NOT THE OTHER?

YES: REPLACE PILOT EXT LT/INTR LT PANEL. TM 55-1520-238-23.

NO: REMOVE DS7. CHECK FOR 28 VDC BETWEEN XDS7-1 AND -2.

IS VOLTAGE PRESENT?

YES: REPLACE TAIL NAVIGATION LIGHT. TM 55-1520-238-23.

NO: CHECK FOR OPEN BETWEEN P100-B15 AND XDS7-1.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-6-1.

NO: REPAIR OPEN WIRE BETWEEN XDS7-2 AND GS691-L. GO TO PARA 9-6-1.

END OF TASK

9-7-1. FORMATION LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23

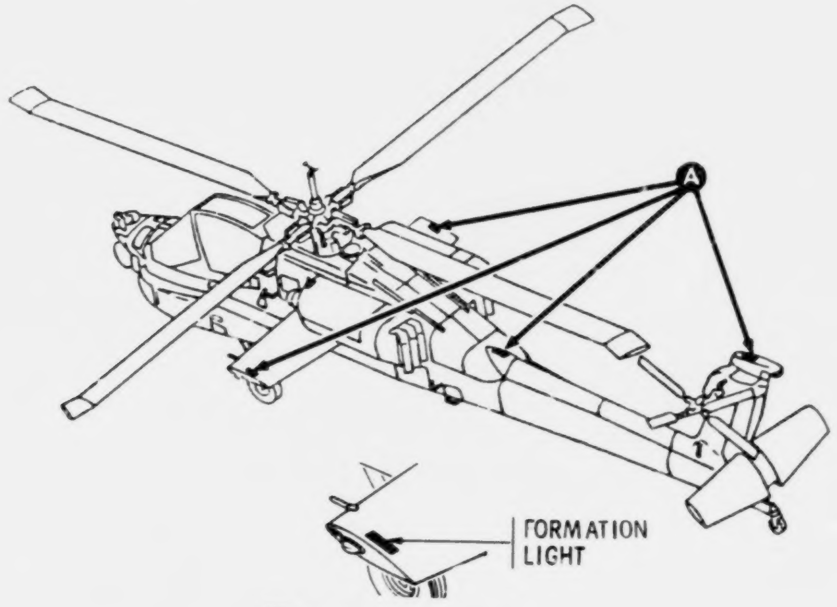
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Formation lights visual inspection performed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

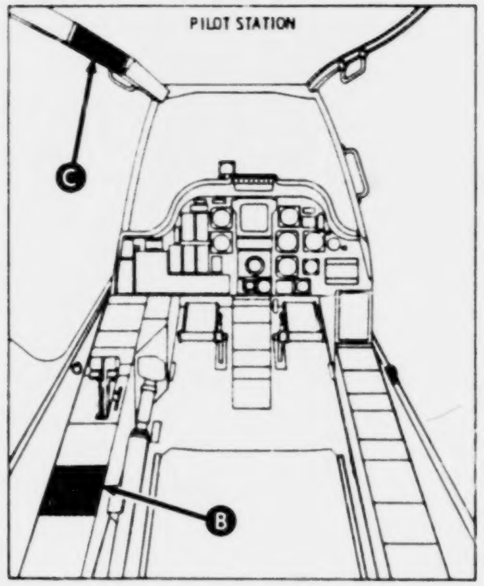
A. Perform operational check as follows:

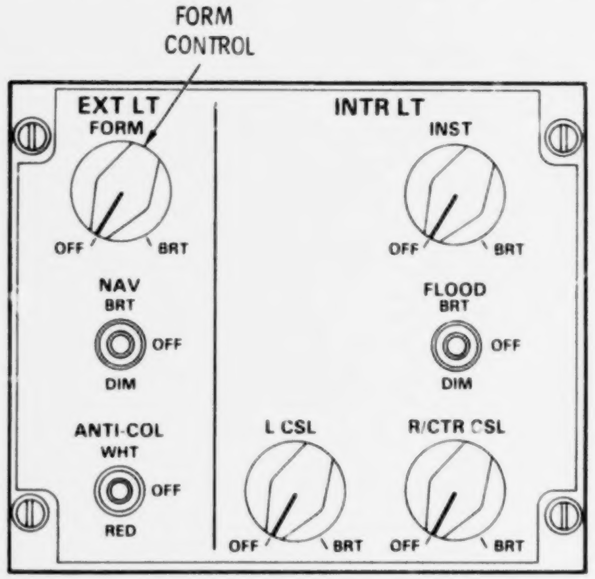
TASK	RESULT
1. On pilot circuit breaker panel, check that **LT FORM** circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-7-4.
2. On **EXT LT/INTR LT** panel, set **FORM** control to **BRT**. Check that all formation lights function.	If left, right, tail, and fuselage formation lights do not function, go to para 9-7-5. If left formation light does not function, go to para 9-7-6. If right formation light does not function, go to para 9-7-7. If tail formation light does not function, go to para 9-7-8. If fuselage formation light does not function, go to para 9-7-9.

B. Perform EXTERNAL POWER - POWER DOWN (para 9-5-3).

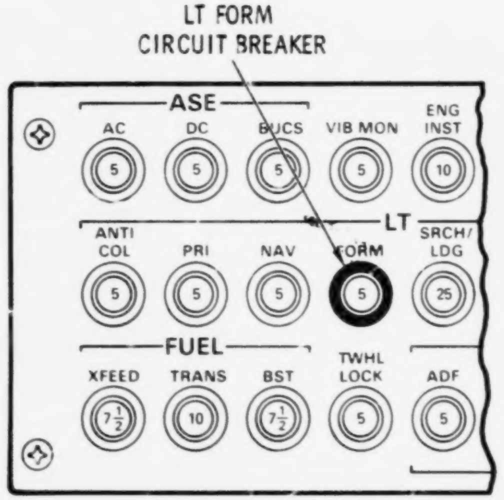


A FORMATION LIGHT
(TYPICAL)





B PILOT EXT LT/INTR LT PANEL

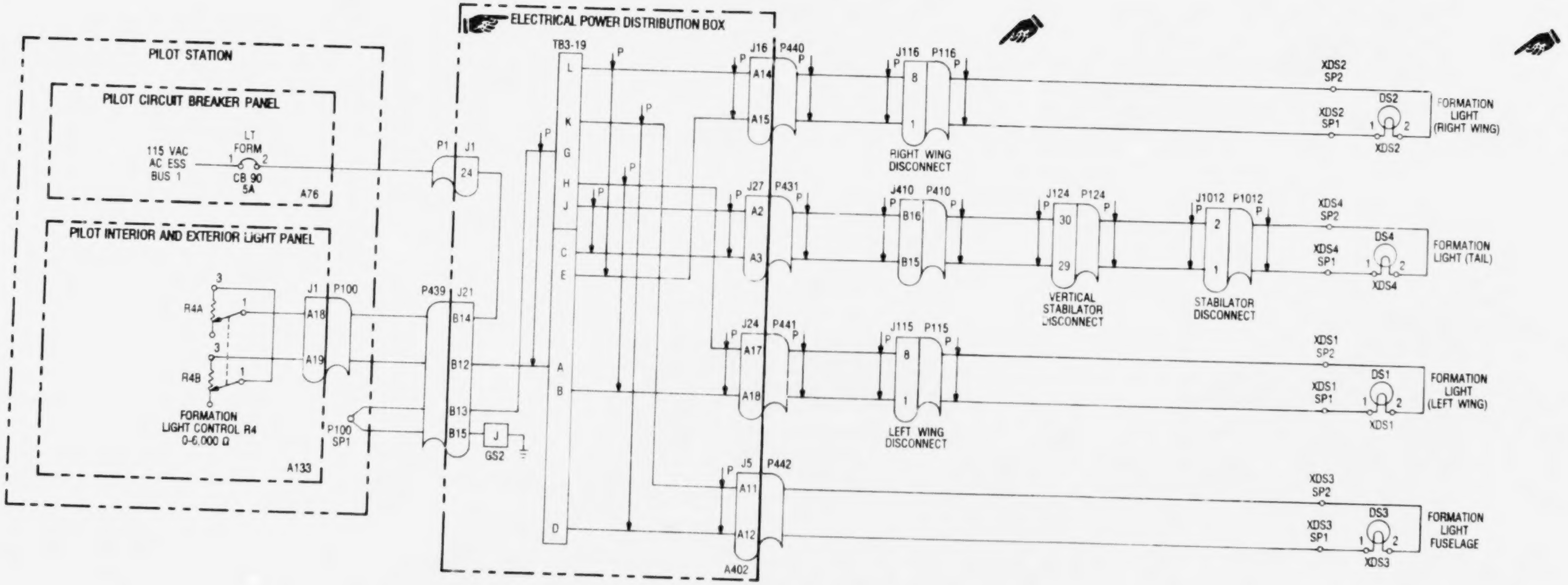


C PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1021B

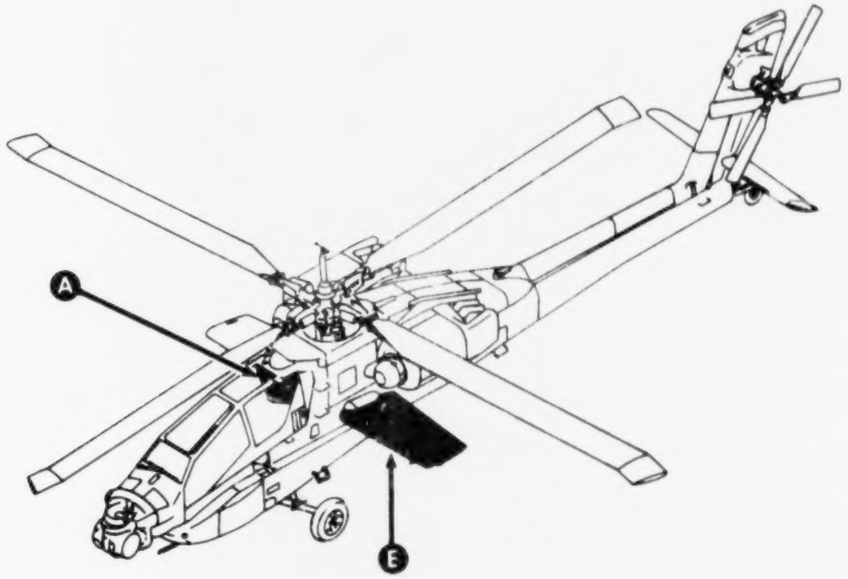
END OF TASK

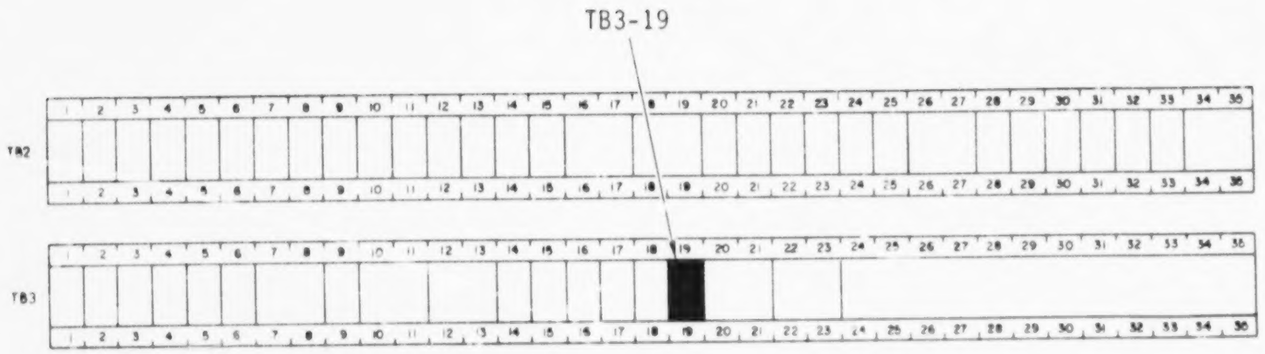
9-7-2. FORMATION LIGHTS - INTERCONNECTION DIAGRAM



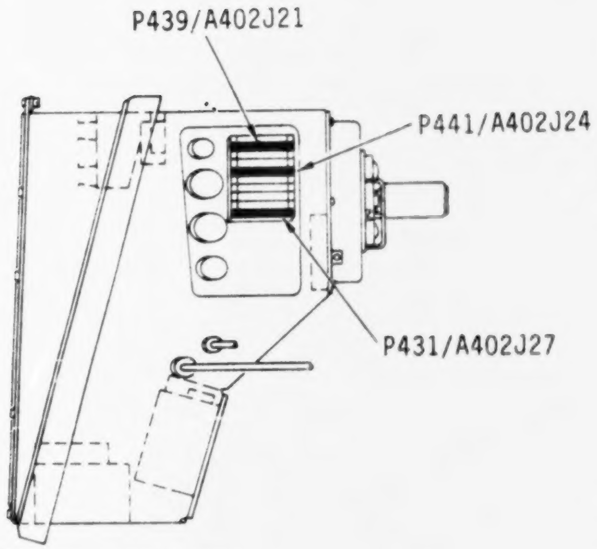
MM04/1-727B

9-7-3. FORMATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

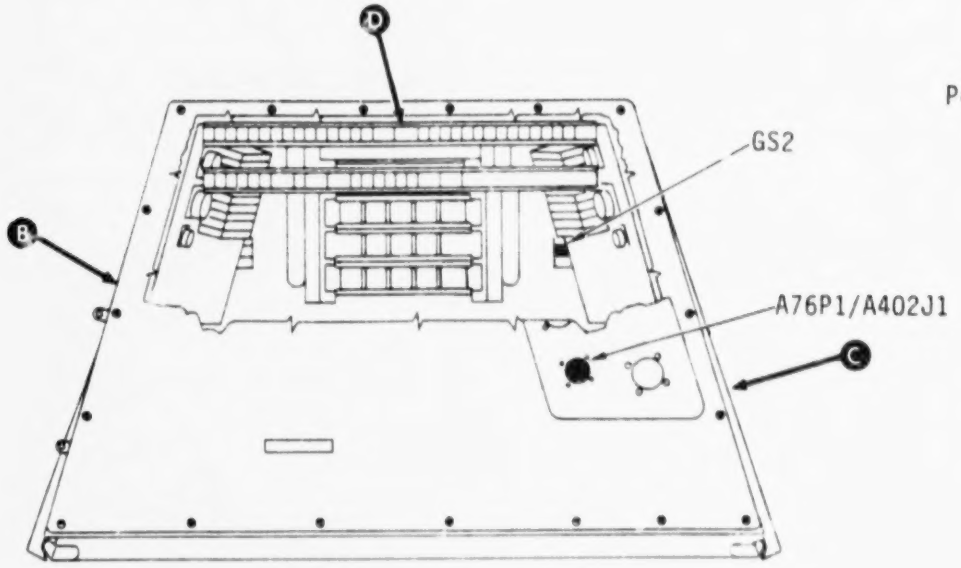




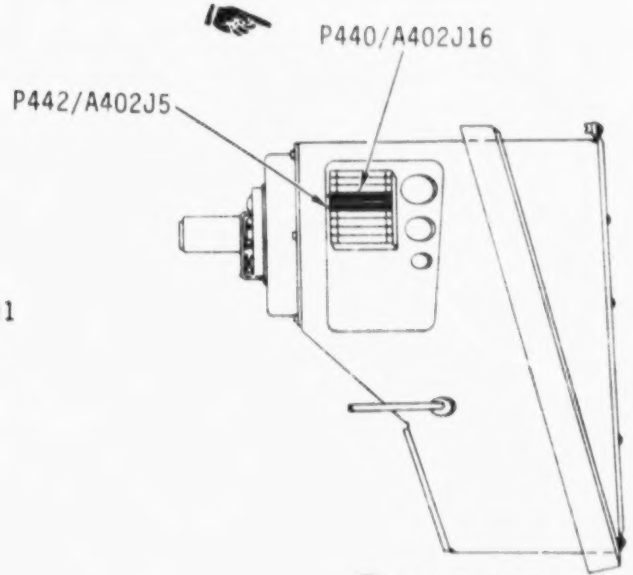
D TERMINAL BOARDS, FORWARD VIEW



C LEFT SIDE VIEW



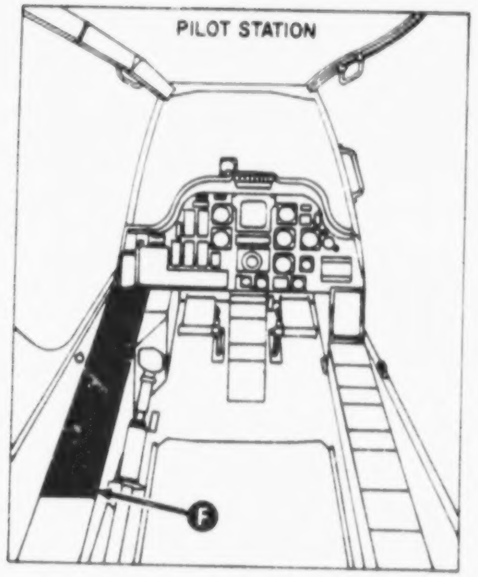
A ELECTRICAL POWER DISTRIBUTION BOX
(AFT VIEW)

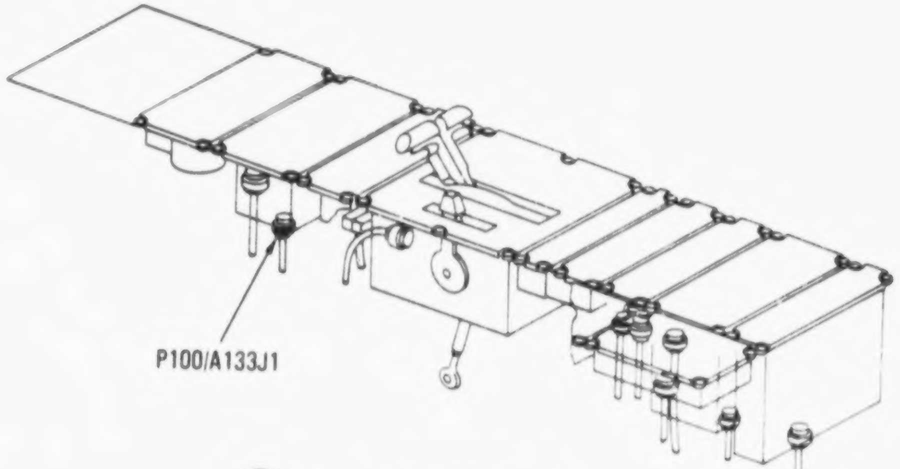


B RIGHT SIDE VIEW

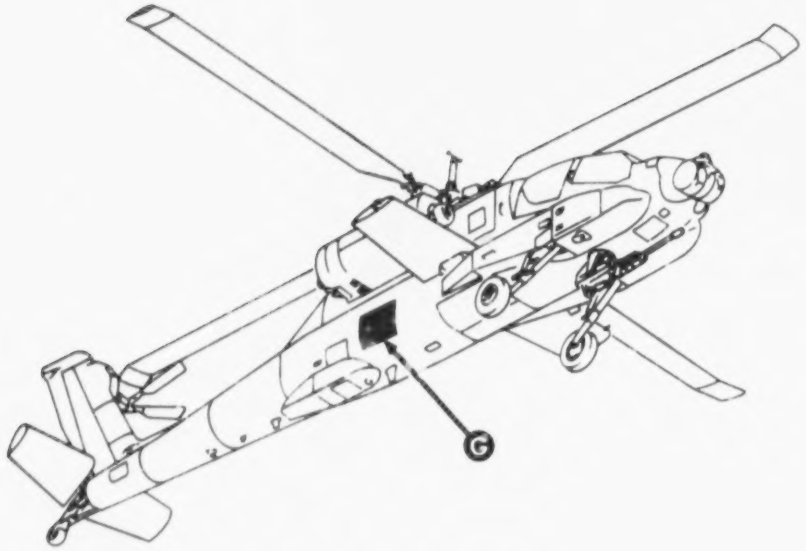
MM04/1-1211-1B

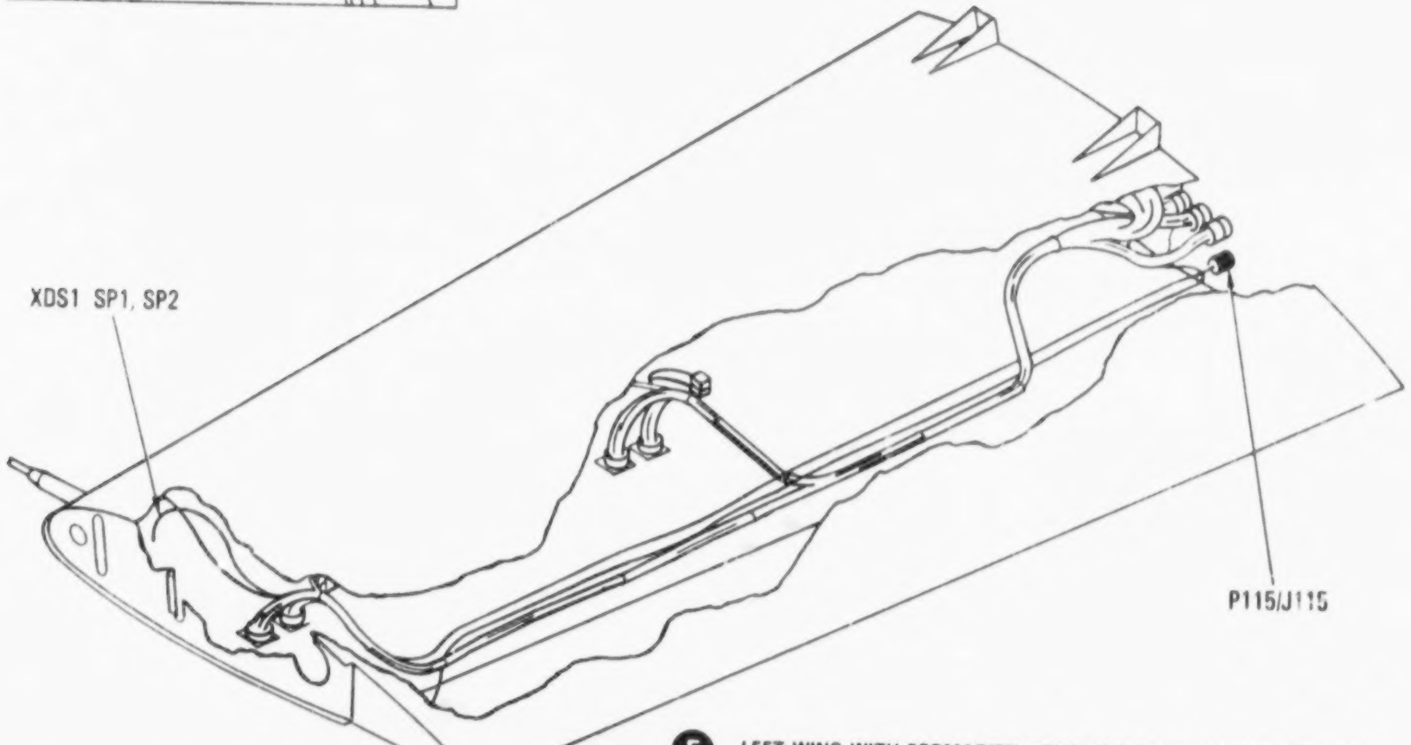
9-7-3. FORMATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



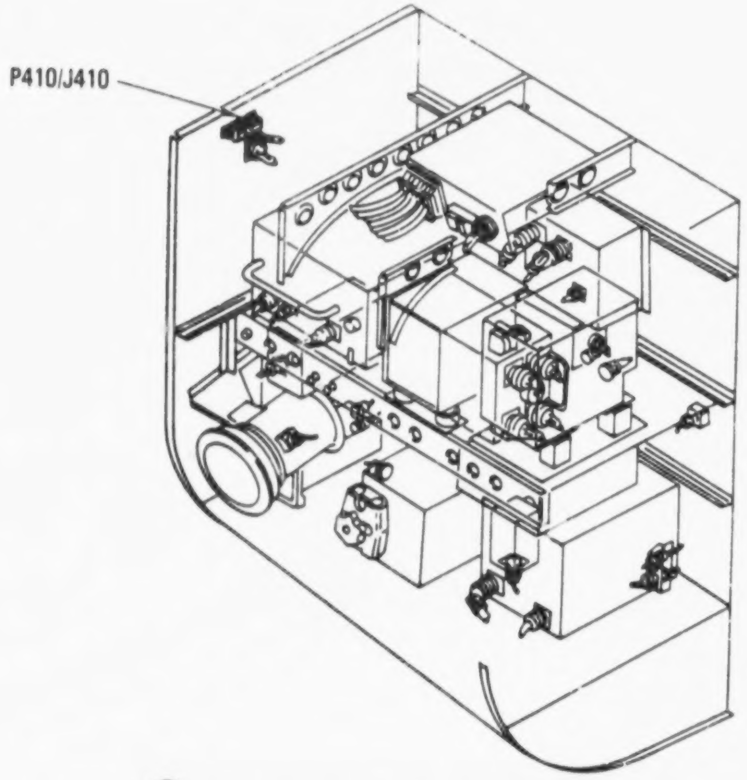


F PILOT LEFT SIDE CONSOLE



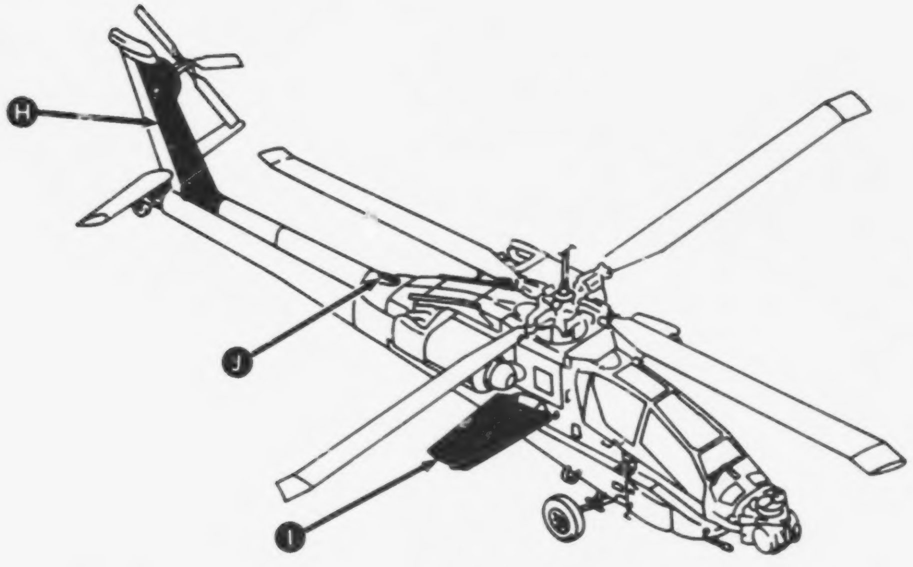


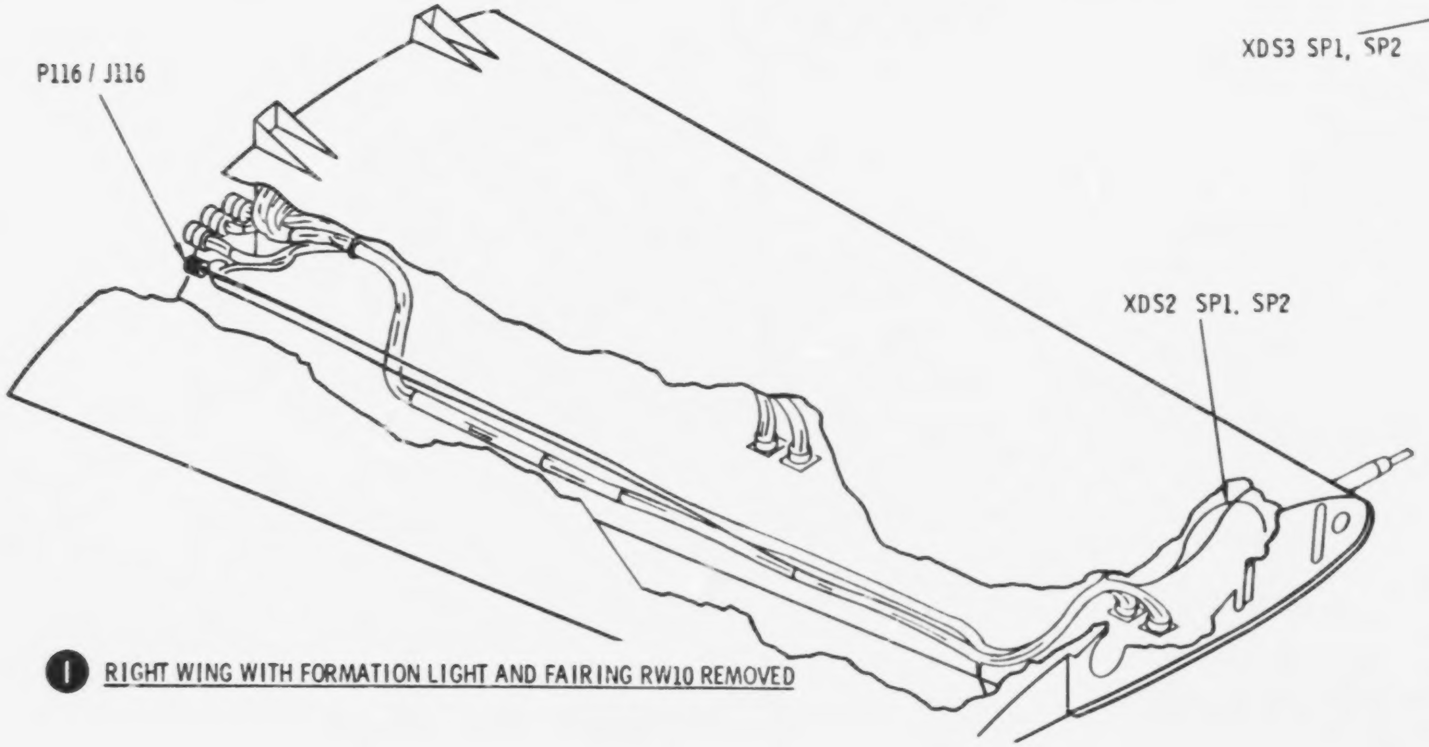
E LEFT WING WITH FORMATION LIGHT AND FAIRING LW10 REMOVED



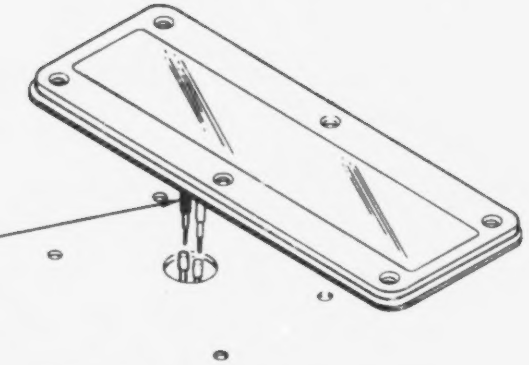
G AFT AVIONICS BAY THROUGH DOOR R295

9-7-3. FORMATION LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

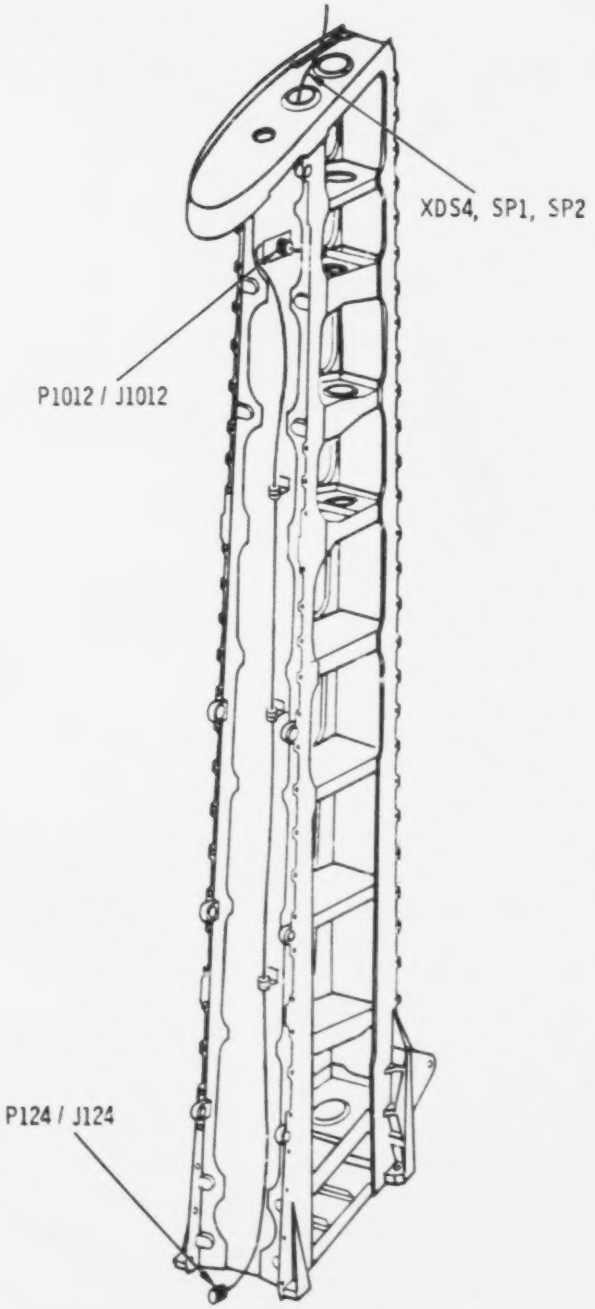




I RIGHT WING WITH FORMATION LIGHT AND FAIRING RW10 REMOVED



J FUSELAGE FORMATION LIGHT



H VERTICAL STABILIZER THROUGH FAIRING R510, L540, AND T545

MM04/1-1211-3

9-7-4. LT FORM CIRCUIT BREAKER (CB90) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

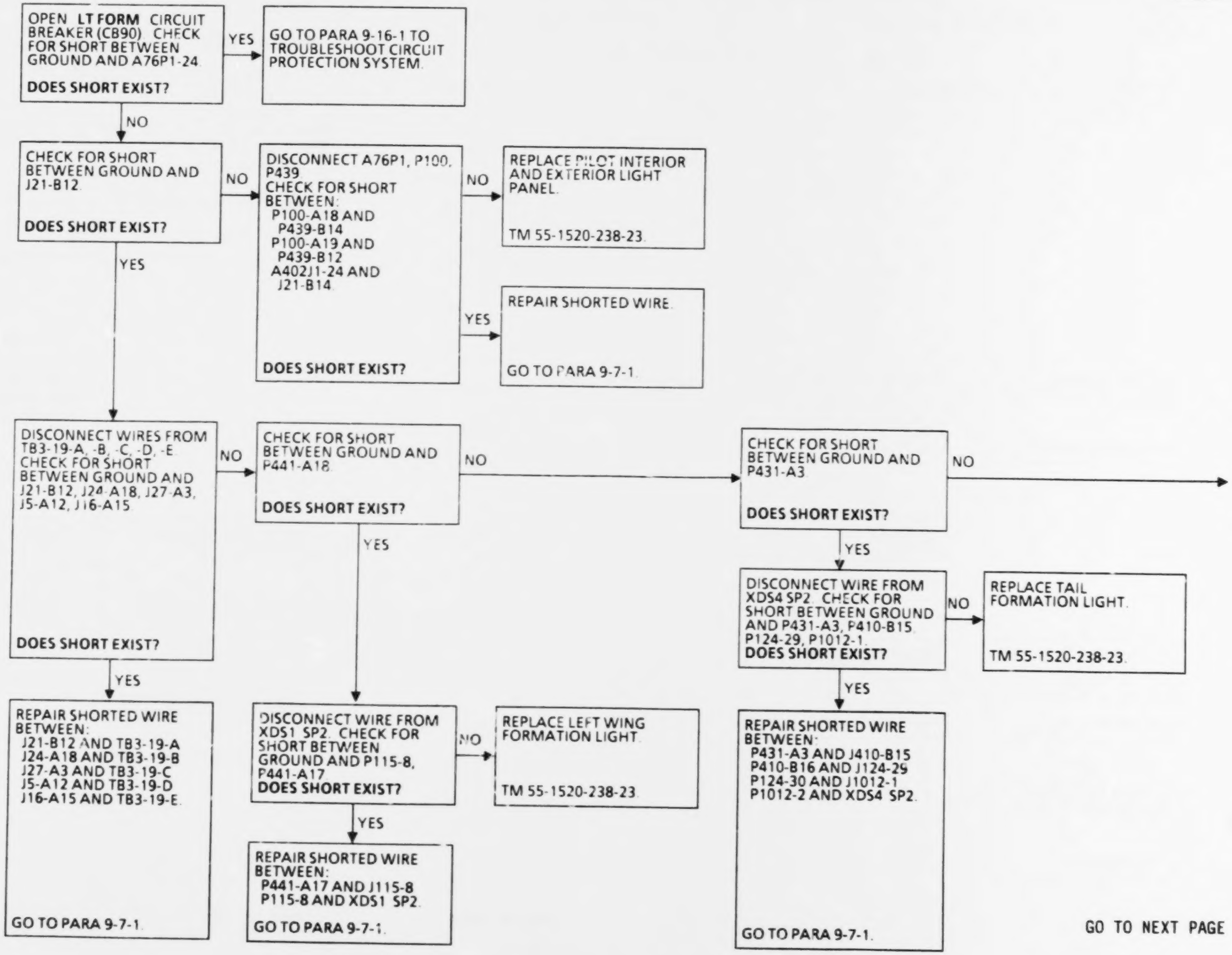
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



OPEN **LT FORM** CIRCUIT BREAKER (CB90). CHECK FOR SHORT BETWEEN GROUND AND A76P1-24.
DOES SHORT EXIST?

GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

CHECK FOR SHORT BETWEEN GROUND AND J21-B12.
DOES SHORT EXIST?

DISCONNECT A76P1, P100, P439. CHECK FOR SHORT BETWEEN:
P100-A18 AND P439-B14
P100-A19 AND P439-B12
A402J1-24 AND J21-B14.
DOES SHORT EXIST?

REPLACE PILOT INTERIOR AND EXTERIOR LIGHT PANEL.
TM 55-1520-238-23.

REPAIR SHORTED WIRE.
GO TO PARA 9-7-1.

DISCONNECT WIRES FROM TB3-19-A, -B, -C, -D, -E. CHECK FOR SHORT BETWEEN GROUND AND J21-B12, J24-A18, J27-A3, J5-A12, J16-A15.
DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND P441-A18.
DOES SHORT EXIST?

CHECK FOR SHORT BETWEEN GROUND AND P431-A3.
DOES SHORT EXIST?

DISCONNECT WIRE FROM XDS4 SP2. CHECK FOR SHORT BETWEEN GROUND AND P431-A3, P410-B15, P124-29, P1012-1.
DOES SHORT EXIST?

REPLACE TAIL FORMATION LIGHT.
TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN:
J21-B12 AND TB3-19-A
J24-A18 AND TB3-19-B
J27-A3 AND TB3-19-C
J5-A12 AND TB3-19-D
J16-A15 AND TB3-19-E.
GO TO PARA 9-7-1.

DISCONNECT WIRE FROM XDS1 SP2. CHECK FOR SHORT BETWEEN GROUND AND P115-8, P441-A17.
DOES SHORT EXIST?

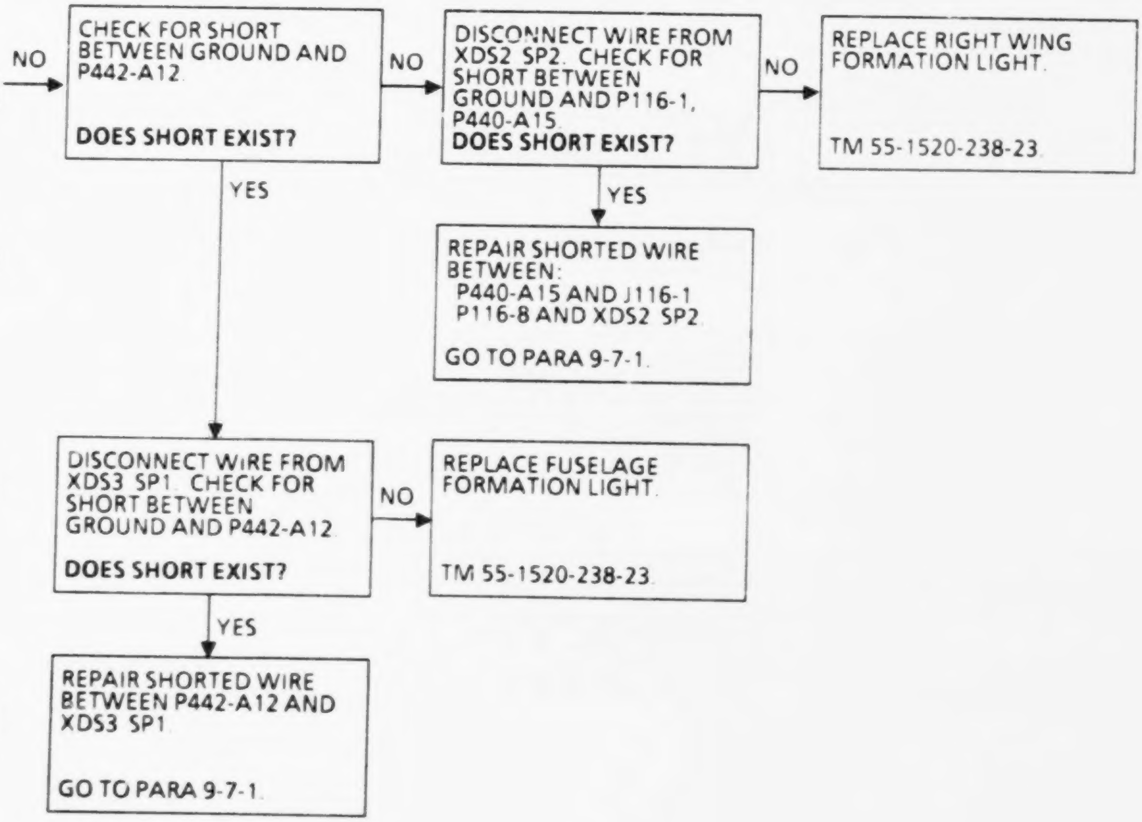
REPLACE LEFT WING FORMATION LIGHT.
TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN:
P441-A17 AND J115-8
P115-8 AND XDS1 SP2.
GO TO PARA 9-7-1.

REPAIR SHORTED WIRE BETWEEN:
P431-A3 AND J410-B15
P410-B16 AND J124-29
P124-30 AND J1012-1
P1012-2 AND XDS4 SP2.
GO TO PARA 9-7-1.

GO TO NEXT PAGE

9-7-4. LT FORM CIRCUIT BREAKER (CB90) - DOES NOT STAY CLOSED (cont)



CHECK FOR SHORT BETWEEN GROUND AND P442-A12.

DOES SHORT EXIST?

DISCONNECT WIRE FROM XDS2 SP2. CHECK FOR SHORT BETWEEN GROUND AND P116-1, P440-A15.

DOES SHORT EXIST?

REPLACE RIGHT WING FORMATION LIGHT.

TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN:
P440-A15 AND J116-1
P116-8 AND XDS2 SP2.

GO TO PARA 9-7-1.

DISCONNECT WIRE FROM XDS3 SP1. CHECK FOR SHORT BETWEEN GROUND AND P442-A12.

DOES SHORT EXIST?

REPLACE FUSELAGE FORMATION LIGHT.

TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN P442-A12 AND XDS3 SP1.

GO TO PARA 9-7-1.

END OF TASK

9-7-5. ALL FORMATION LIGHTS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

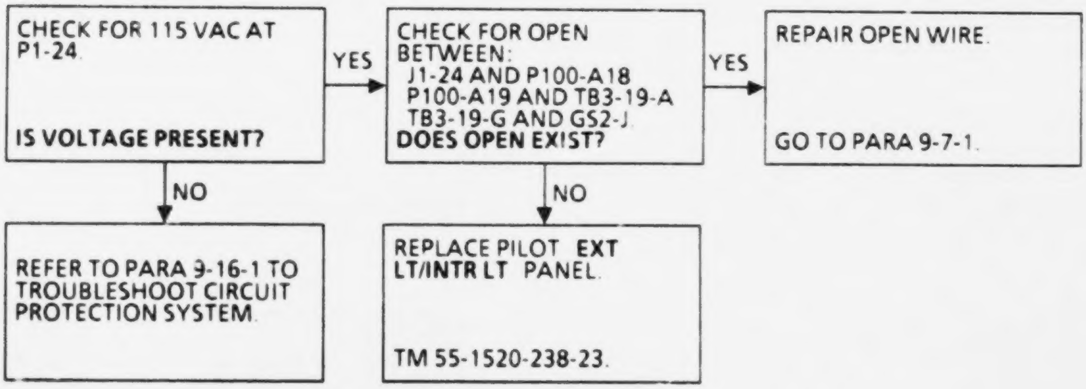
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-7-6. LEFT WING FORMATION LIGHT - DOES NOT FUNCTION

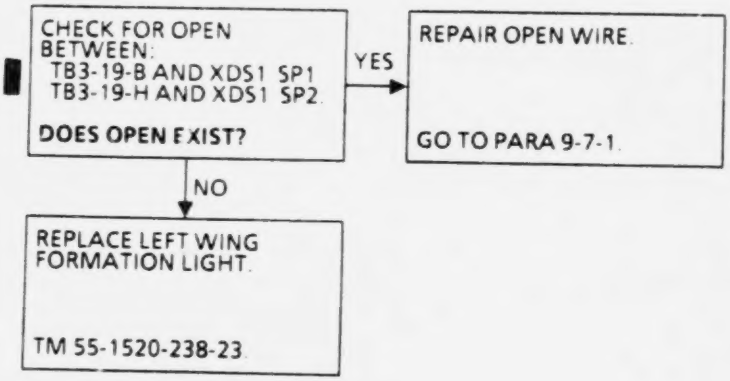
Tools: (para 9-7-5)

Personnel Required: (para 9-7-5)

References: (para 9-7-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



END OF TASK

9-7-7. RIGHT WING FORMATION LIGHT - DOES NOT FUNCTION

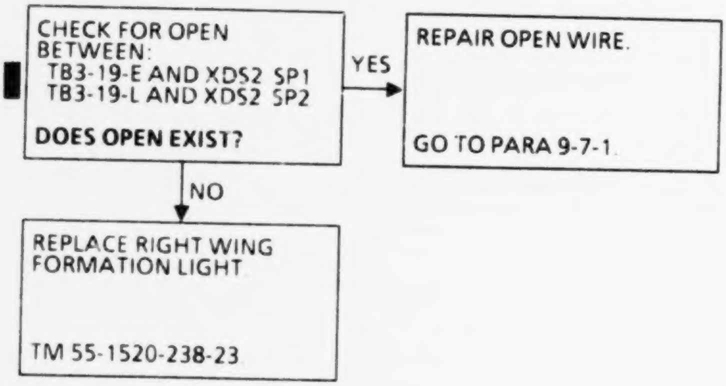
Tools: (para 9-7-5)

Personnel Required: (para 9-7-5)

References: (para 9-7-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



END OF TASK

9-7-8. TAIL FORMATION LIGHT - DOES NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

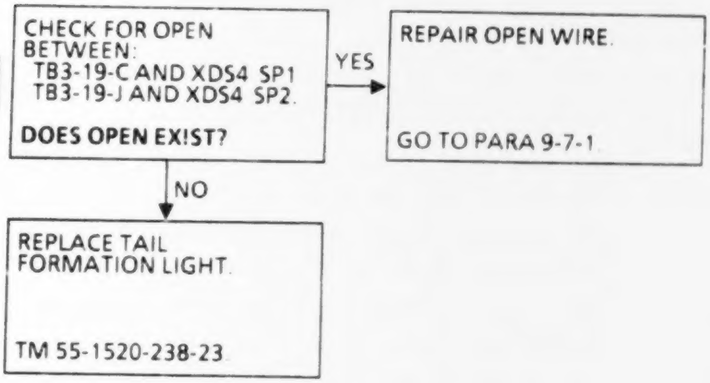
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



CHECK FOR OPEN BETWEEN:
TB3-19-C AND XDS4 SP1
TB3-19-J AND XDS4 SP2.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.

GO TO PARA 9-7-1.

NO: REPLACE TAIL FORMATION LIGHT.

TM 55-1520-238-23

END OF TASK

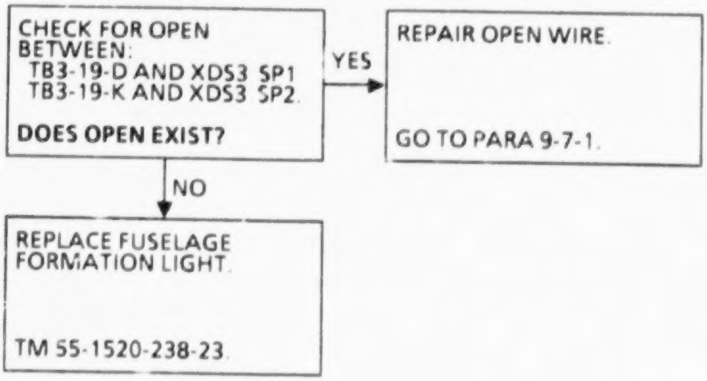
9-7-9. FUSELAGE FORMATION LIGHT - DOES NOT FUNCTION

Tools: (para 9-7-8)

Personnel Required: (para 9-7-8)

References: (para 9-7-8)

Equipment Conditions: (para 9-7-8)



CHECK FOR OPEN BETWEEN:
TB3-19-D AND XDS3 SP1
TB3-19-K AND XDS3 SP2.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-7-1.

REPLACE FUSELAGE FORMATION LIGHT.

TM 55-1520-238-23.

END OF TASK

9-8-1. ANTI-COLLISION LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

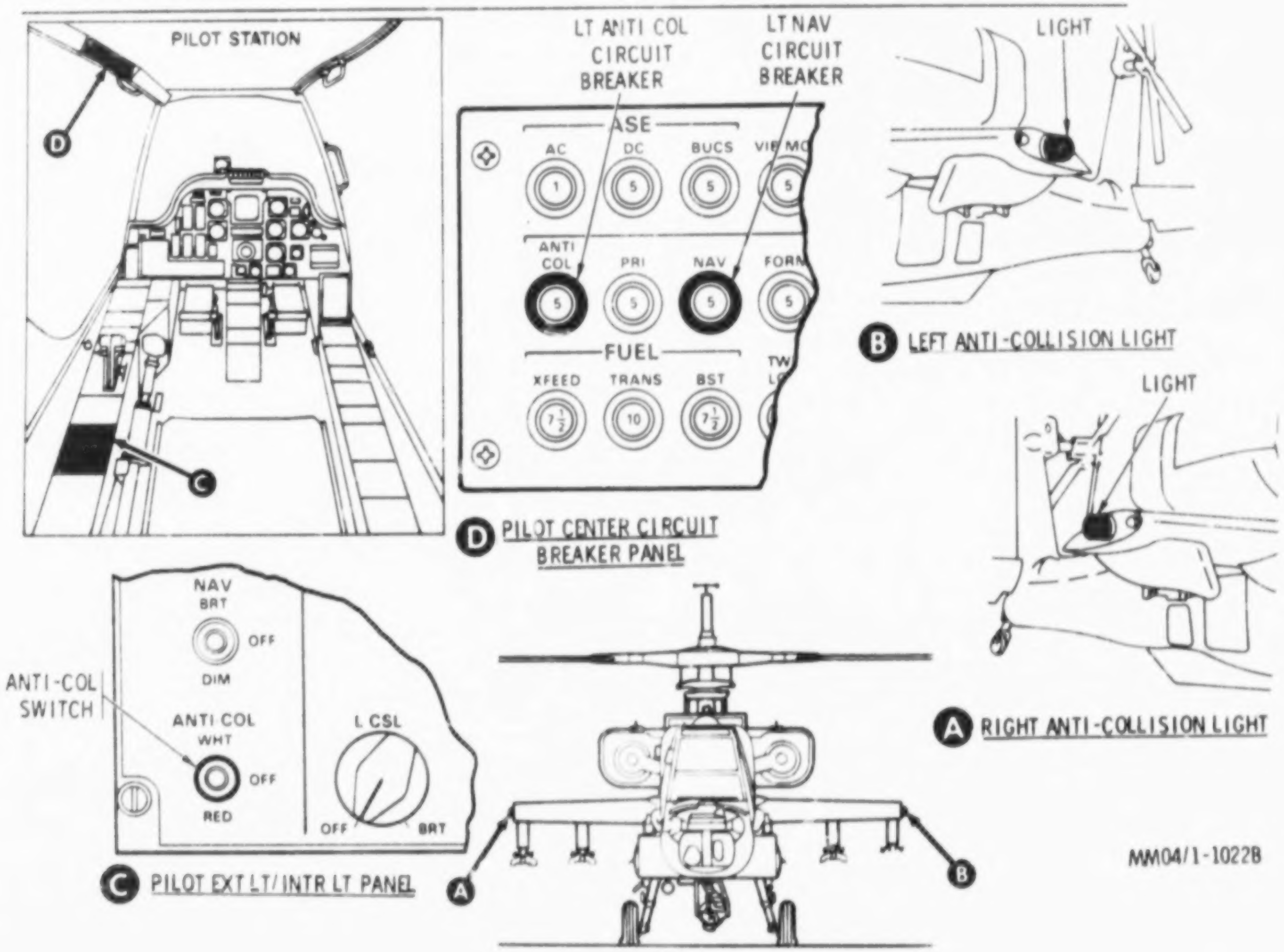
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Anti-collision lights visual inspection performed
	External power application - Electrical
Para 1-3-2	ICS connected



D PILOT CENTER CIRCUIT BREAKER PANEL

B LEFT ANTI-COLLISION LIGHT

A RIGHT ANTI-COLLISION LIGHT

C PILOT EXT LT/INTR LT PANEL

MM04/1-1022B

A. Perform operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that **LT NAV** and **LT ANTI COL** circuit breakers are closed.	If **LT NAV** circuit breaker (CB73) does not stay closed, go to para 9-6-1 to troubleshoot navigation lights. If **LT ANTI COL** circuit breaker (CB40) does not stay closed, go to para 9-8-6.

WARNING

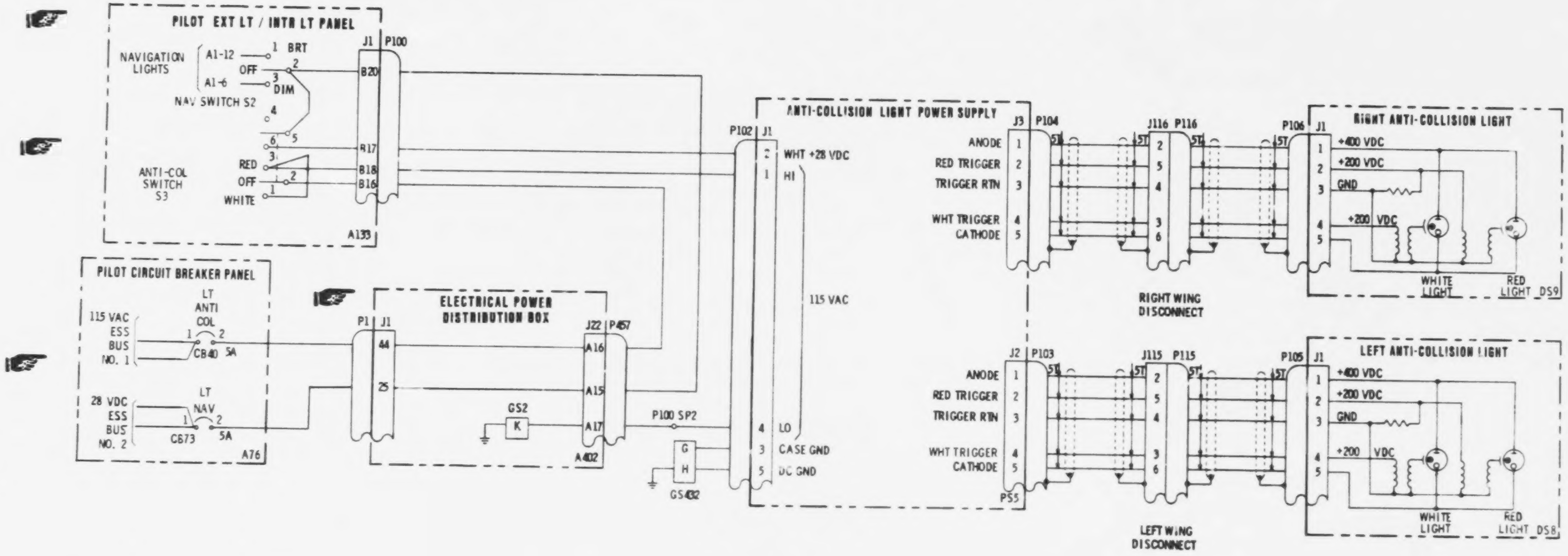
Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

TASK	RESULT
2. On **EXT LT/INTR LT** panel, set **ANTI-COL** switch to **RED.** Check that left and right red anti-collision lights are flashing.	If **LT ANTI COL** circuit breaker does not stay closed, go to para 9-8-6. If left and right red anti-collision lights do not flash, go to para 9-8-4. If left red anti-collision light is not flashing, go to para 9-8-8. If right red anti-collision light is not flashing, go to para 9-8-9.
3. With **ANTI-COL** switch set to **WHITE,** check that left and right white anti-collision lights are flashing.	If **LT NAV** circuit breaker does not stay closed, go to para 9-8-7. If left and right white anti-collision lights do not flash, go to para 9-8-5. If left white anti-collision light is not flashing, go to para 9-8-10. If right white anti-collision light is not flashing, go to para 9-8-11.
4. On **EXT LT/INTR LT** panel, set **ANTI-COL** switch to **OFF.**	

B. Remove external power - Electrical (TM 55-1520-238-23).

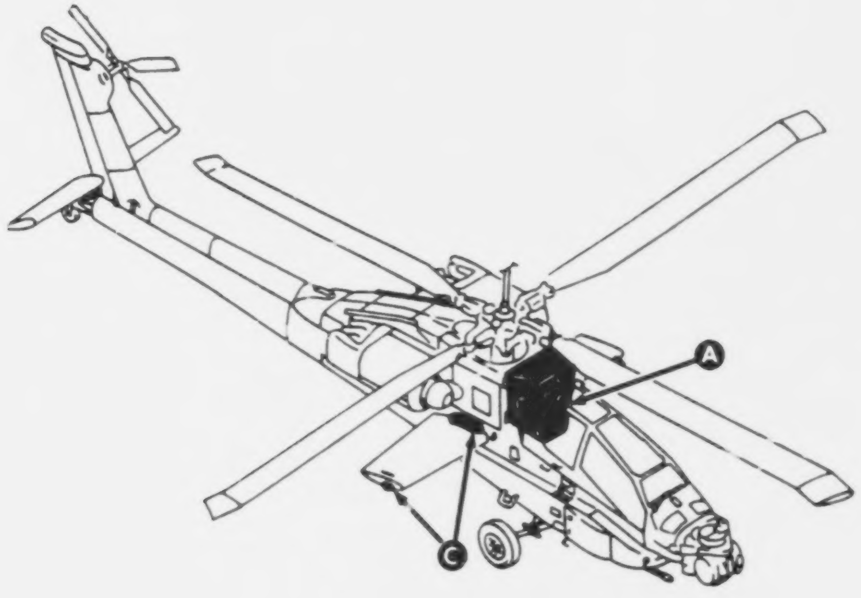
END OF TASK

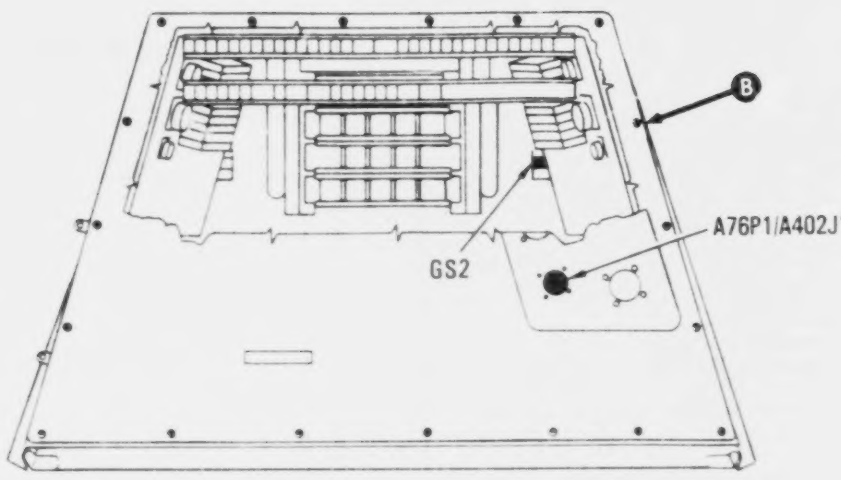
9-8-2. ANTI-COLLISION LIGHTS - INTERCONNECTION DIAGRAM



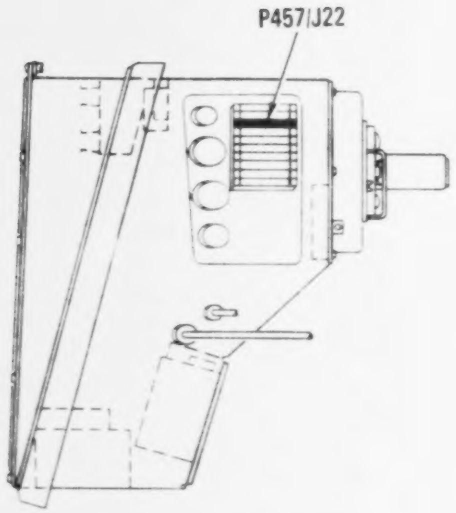
MM04/1-728B

9-8-3. ANTI-COLLISION LGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

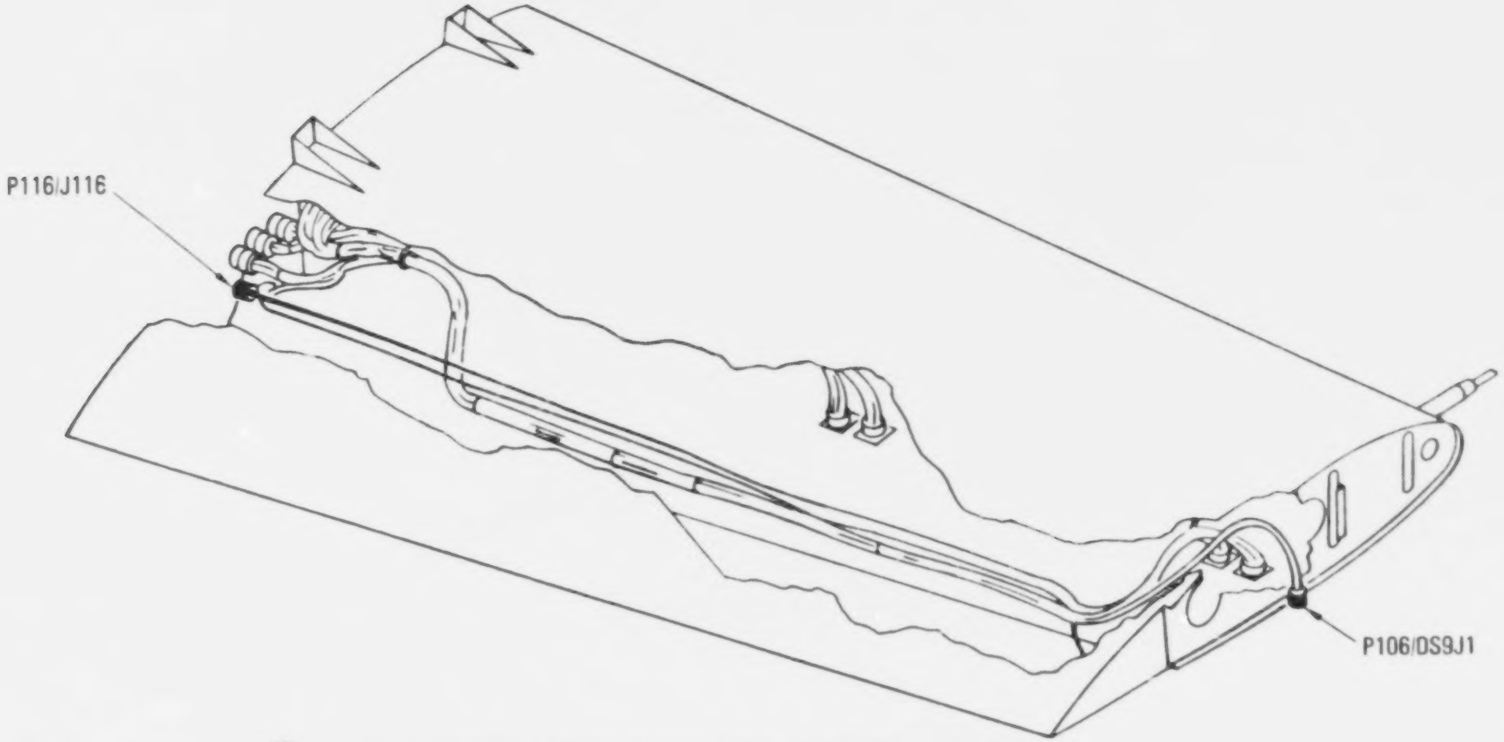




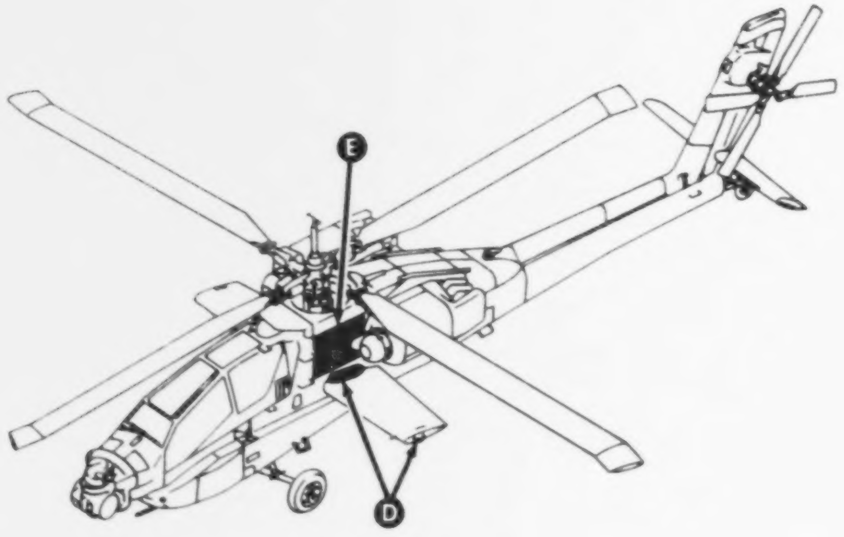
A ELECTRICAL POWER CENTER (AFT VIEW)



B LEFT SIDE VIEW (ROTATED)

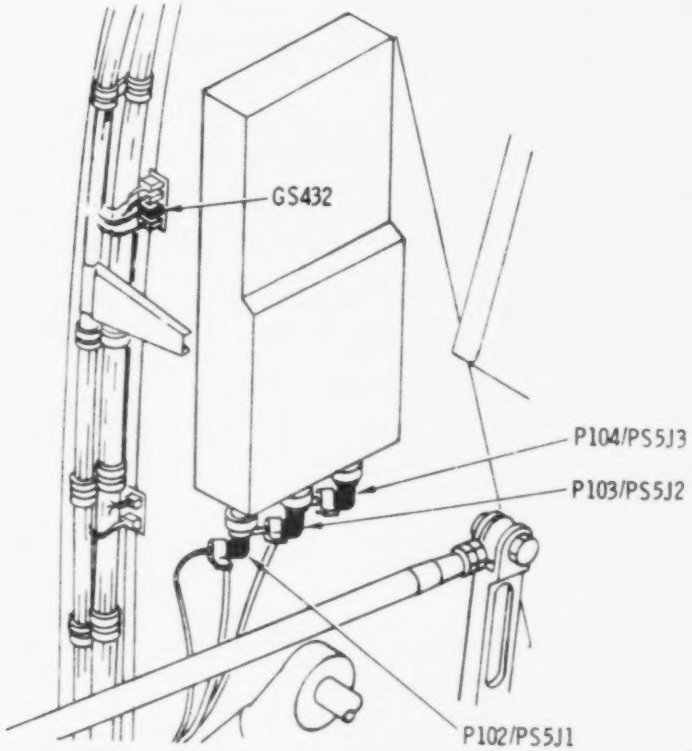


C RIGHT WING WITH ANTI-COLLISION LIGHT AND FAIRING RW10 REMOVED

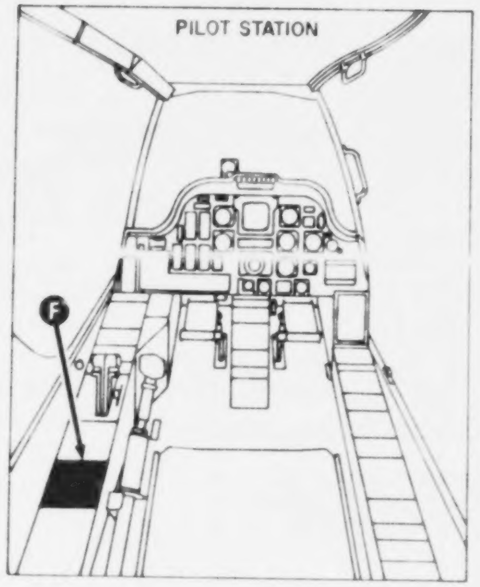


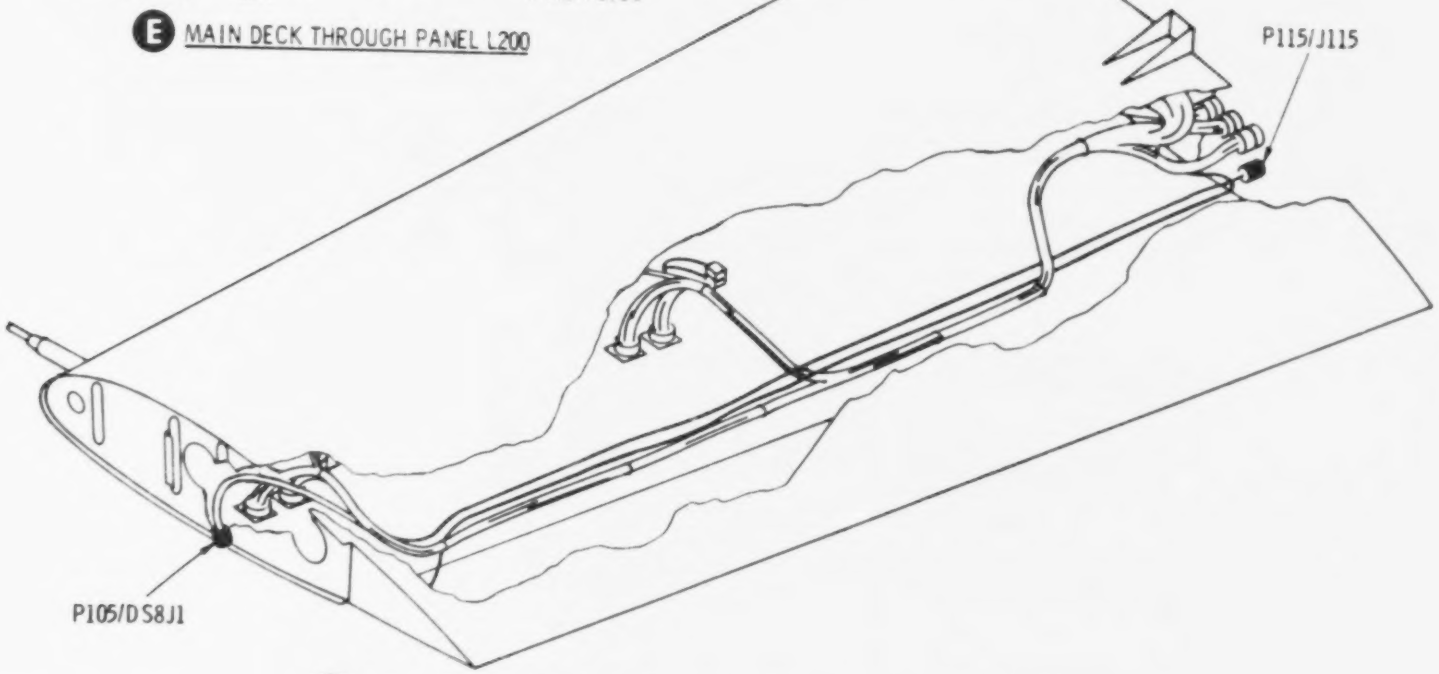
MM04/1-1212-1A

9-8-3. ANTI-COLLISION LGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

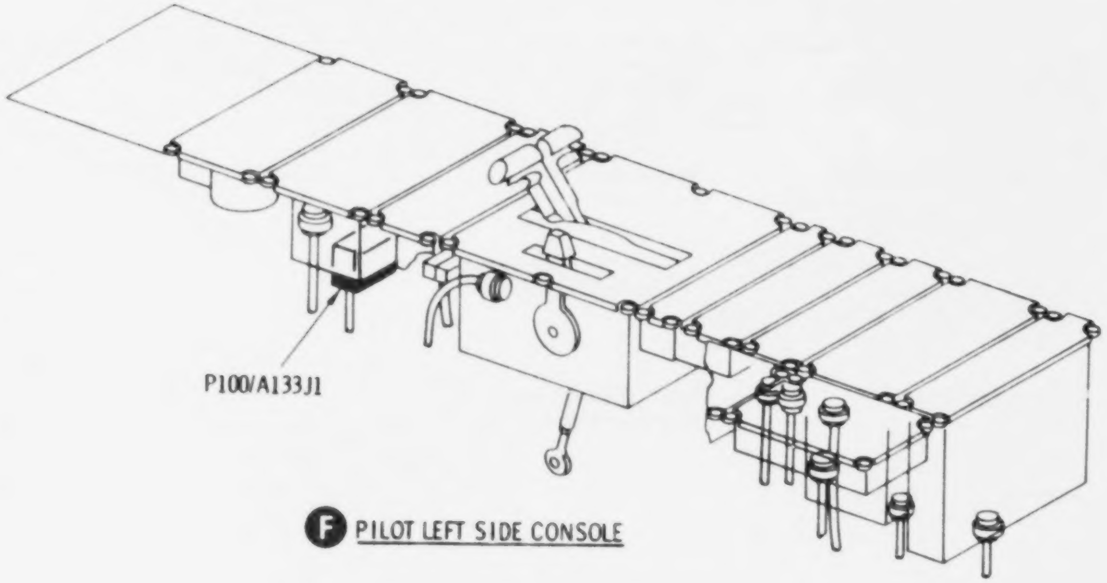


E MAIN DECK THROUGH PANEL L200





D LEFT WING WITH ANTI - COLLISION LIGHT AND FAIRING LW10 REMOVED



F PILOT LEFT SIDE CONSOLE

MM04/1212-2A

9-8-4. RED ANTI-COLLISION LIGHTS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

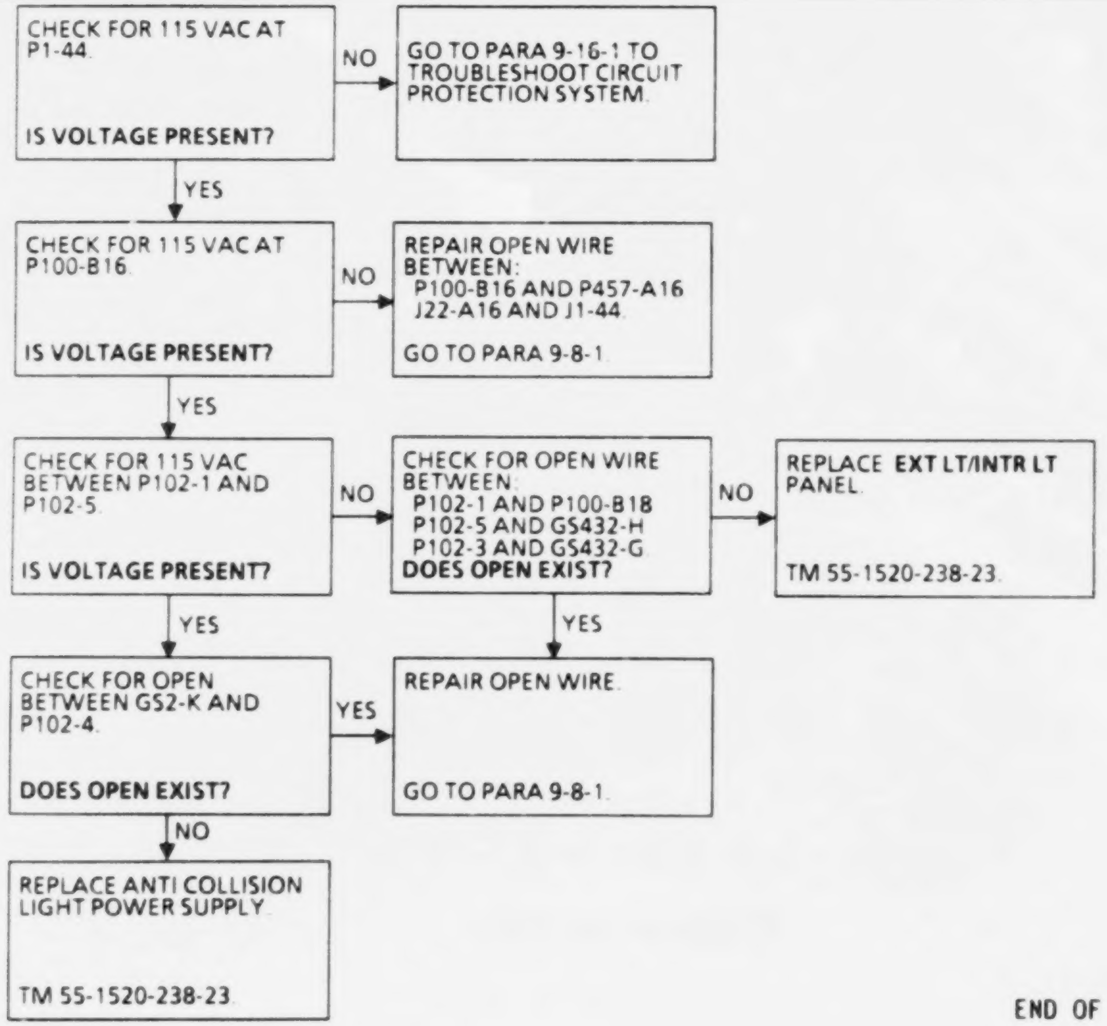
REFER TO WARNINGS

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 1-3-2	ICS connected


CHECK FOR 115 VAC AT P1-44.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR 115 VAC AT P100-B16.
IS VOLTAGE PRESENT?
NO
REPAIR OPEN WIRE BETWEEN: P100-B16 AND P457-A16 J22-A16 AND J1-44.
GO TO PARA 9-8-1.
YES
CHECK FOR 115 VAC BETWEEN P102-1 AND P102-5.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN: P102-1 AND P100-B18 P102-5 AND GS432-H P102-3 AND GS432-G
DOES OPEN EXIST?
NO
REPLACE EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
YES
CHECK FOR OPEN BETWEEN GS2-K AND P102-4.
DOES OPEN EXIST?
YES
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-8-5. WHITE ANTI-COLLISION LIGHTS - DO NOT FUNCTION

Tools: (para 9-8-4)

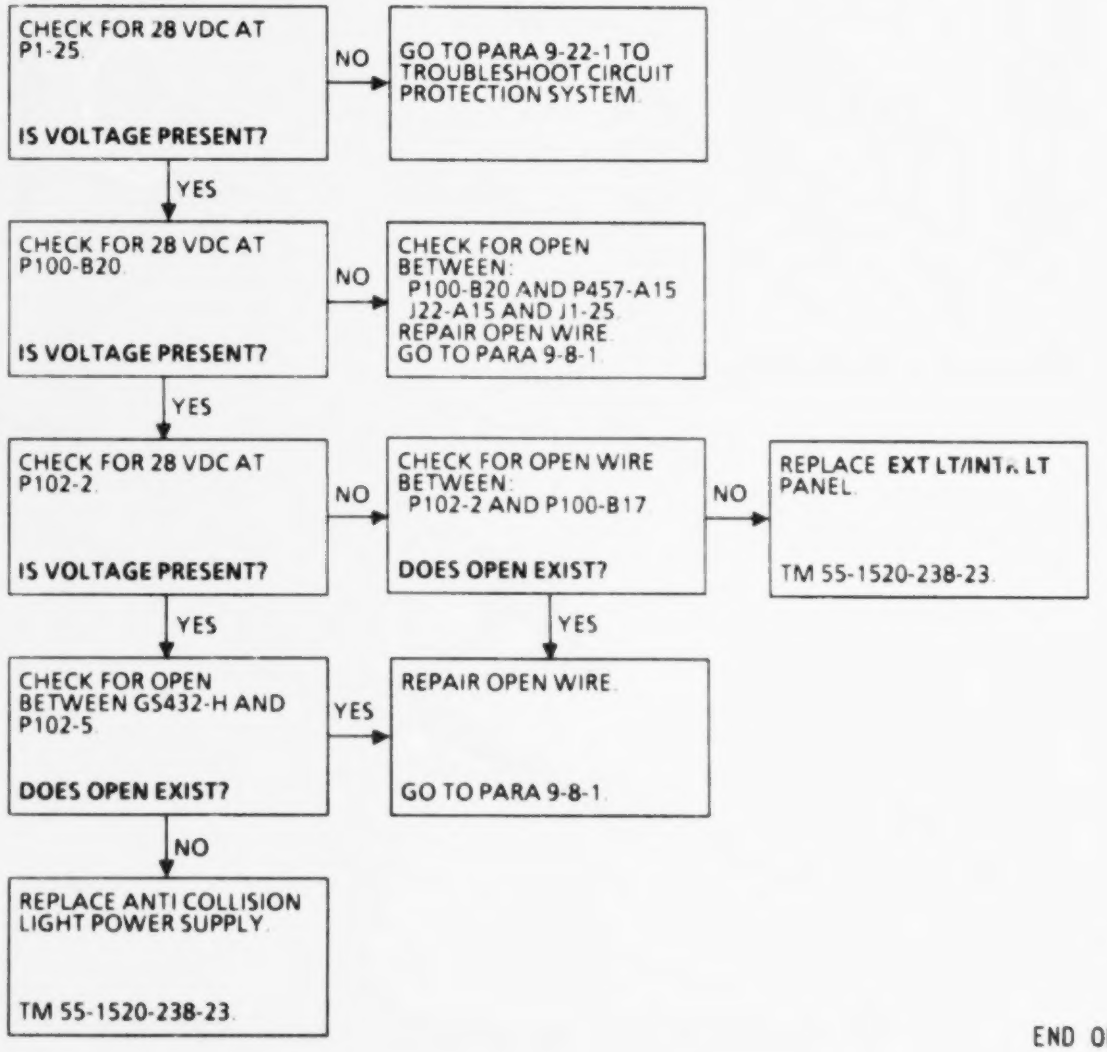
Personnel Required: (para 9-8-4)

References: (para 9-8-4)

Equipment Conditions: (para 9-8-4)

WARNING

- Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.
- Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.


CHECK FOR 28 VDC AT P1-25.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-22-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR 28 VDC AT P100-B20.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: P100-B20 AND P457-A15 J22-A15 AND J1-25. REPAIR OPEN WIRE. GO TO PARA 9-8-1.
YES
CHECK FOR 28 VDC AT P102-2.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN: P102-2 AND P100-B17
DOES OPEN EXIST?
NO
REPLACE EXT LT/INTR LT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
YES
CHECK FOR OPEN BETWEEN GS432-H AND P102-5.
DOES OPEN EXIST?
YES
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-8-6. LT ANTI COL CIRCUIT BREAKER (CB40) - DOES NOT STAY CLOSED

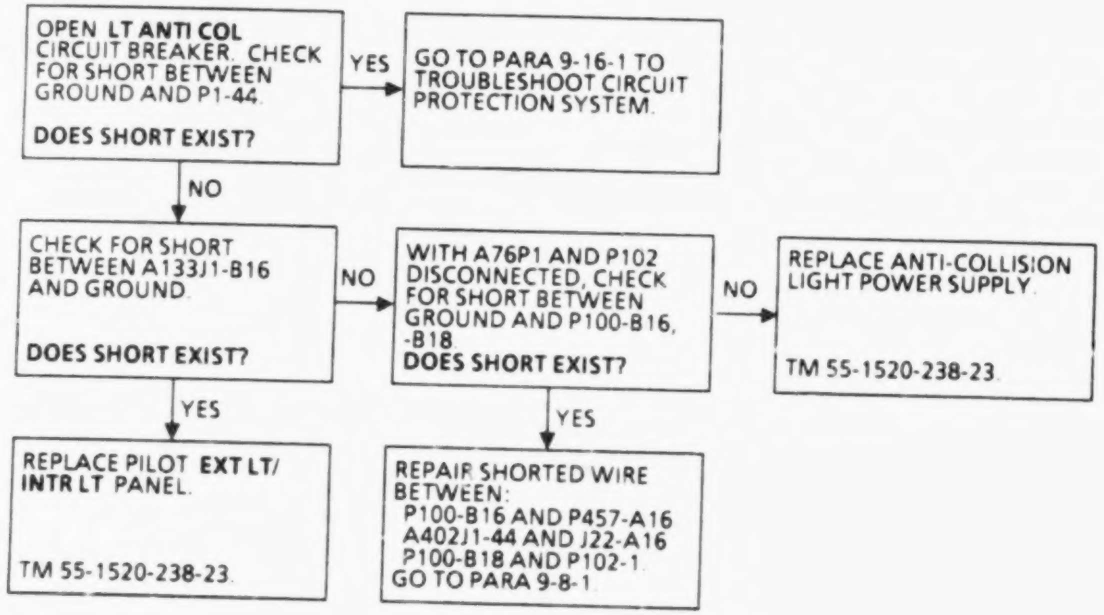
Tools: (para 9-8-4)

Personnel Required: (para 9-8-4)

References: (para 9-8-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN **LT ANTI COL** CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND P1-44.

DOES SHORT EXIST?

YES: GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

NO: CHECK FOR SHORT BETWEEN A133J1-B16 AND GROUND.

DOES SHORT EXIST?

YES: REPLACE PILOT **EXT LT/INTR LT** PANEL.

TM 55-1520-238-23.

NO: WITH A76P1 AND P102 DISCONNECTED, CHECK FOR SHORT BETWEEN GROUND AND P100-B16, -B18.

DOES SHORT EXIST?

NO: REPLACE ANTI-COLLISION LIGHT POWER SUPPLY.

TM 55-1520-238-23.

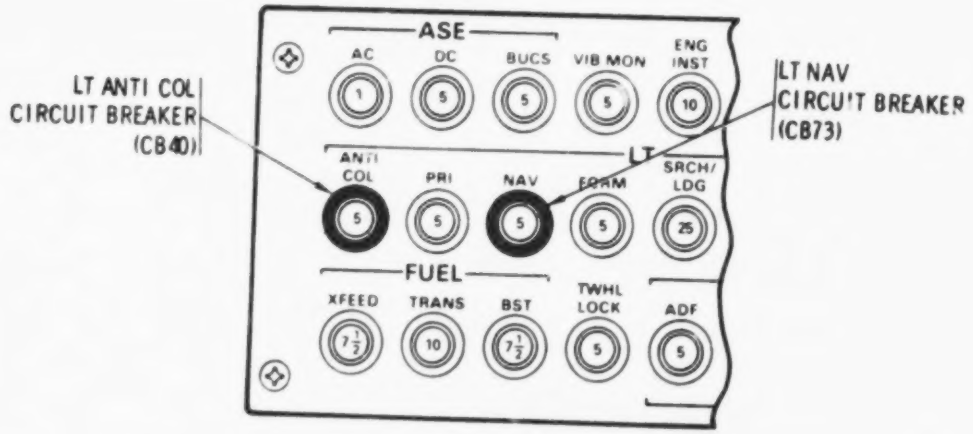
YES: REPAIR SHORTED WIRE BETWEEN:

P100-B16 AND P457-A16

A402J1-44 AND J22-A16

P100-B18 AND P102-1.

GO TO PARA 9-8-1.



PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1453

END OF TASK

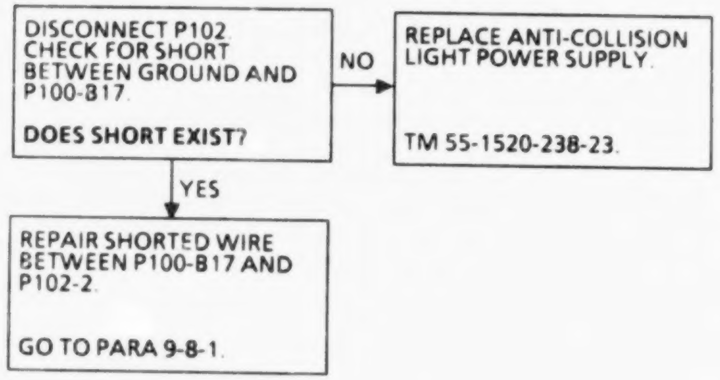
9-8-7. LT NAV CIRCUIT BREAKER (CB73) - DOES NOT STAY CLOSED

Tools: (para 9-8-4)

Personnel Required: (para 9-8-4)

References: (para 9-8-4)

Equipment Conditions: (para 9-8-6)


DISCONNECT P102. CHECK FOR SHORT BETWEEN GROUND AND P100-B17.

DOES SHORT EXIST?

NO: REPLACE ANTI-COLLISION LIGHT POWER SUPPLY.

TM 55-1520-238-23.

YES: REPAIR SHORTED WIRE BETWEEN P100-B17 AND P102-2.

GO TO PARA 9-8-1.

END OF TASK

9-8-8. LEFT WING RED ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

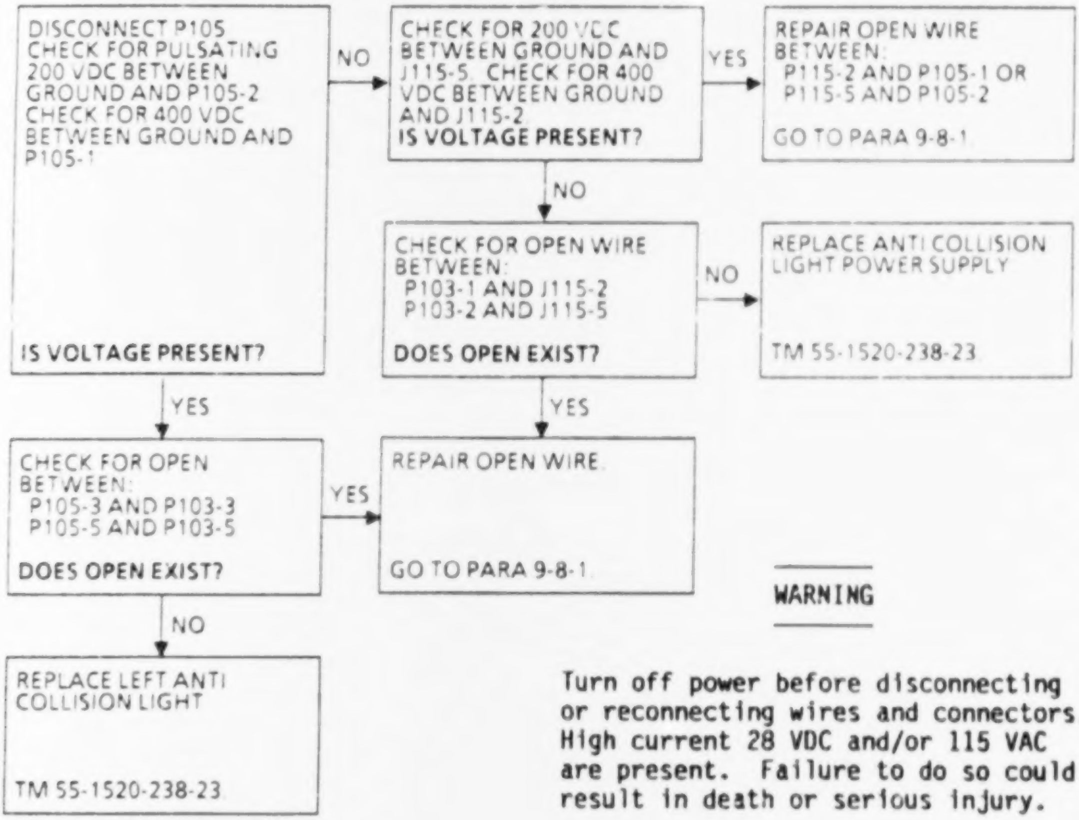
REFER TO VOLTAGE WARNING

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - LW8 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.


DISCONNECT P105 CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P105-2 CHECK FOR 400 VDC BETWEEN GROUND AND P105-1
IS VOLTAGE PRESENT?
NO
CHECK FOR 200 VDC BETWEEN GROUND AND J115-5. CHECK FOR 400 VDC BETWEEN GROUND AND J115-2.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN: P115-2 AND P105-1 OR P115-5 AND P105-2
GO TO PARA 9-8-1.
NO
CHECK FOR OPEN WIRE BETWEEN: P103-1 AND J115-2 P103-2 AND J115-5
DOES OPEN EXIST?
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY
TM 55-1520-238-23
YES
YES
CHECK FOR OPEN BETWEEN: P105-3 AND P103-3 P105-5 AND P103-5
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
NO
REPLACE LEFT ANTI COLLISION LIGHT
TM 55-1520-238-23

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-8-9. RIGHT WING RED ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools: (para 9-8-8)

Personnel Required: (para 9-8-8)

References: (para 9-8-8)

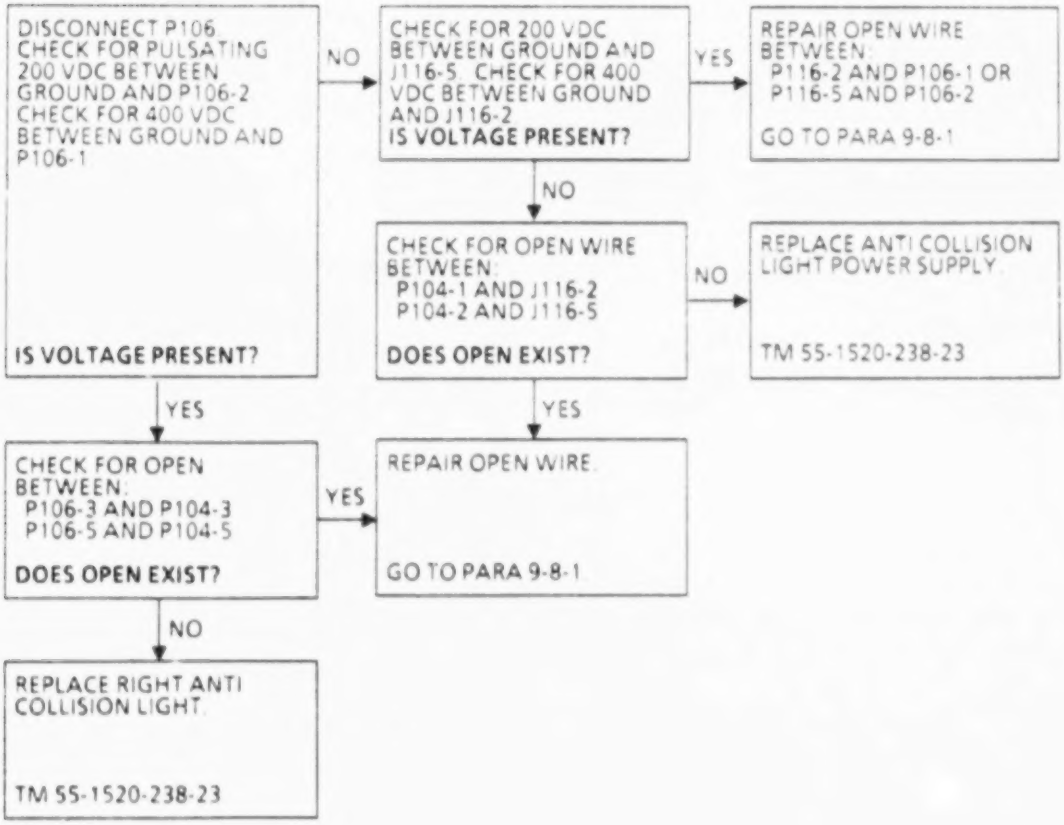
WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - RW8 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

REFER TO VOLTAGE WARNING


DISCONNECT P106. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P106-2. CHECK FOR 400 VDC BETWEEN GROUND AND P106-1. IS VOLTAGE PRESENT?
NO
CHECK FOR 200 VDC BETWEEN GROUND AND J116-5. CHECK FOR 400 VDC BETWEEN GROUND AND J116-2. IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN: P116-2 AND P106-1 OR P116-5 AND P106-2. GO TO PARA 9-8-1
NO
CHECK FOR OPEN WIRE BETWEEN: P104-1 AND J116-2 P104-2 AND J116-5. DOES OPEN EXIST?
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY. TM 55-1520-238-23
YES
YES
REPAIR OPEN WIRE. GO TO PARA 9-8-1
CHECK FOR OPEN BETWEEN: P106-3 AND P104-3 P106-5 AND P104-5. DOES OPEN EXIST?
YES
NO
REPLACE RIGHT ANTI COLLISION LIGHT. TM 55-1520-238-23

END OF TASK

9-8-10. LEFT WING WHITE ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools: (para 9-8-8)

Personnel Required: (para 9-8-8)

References: (para 9-8-8)

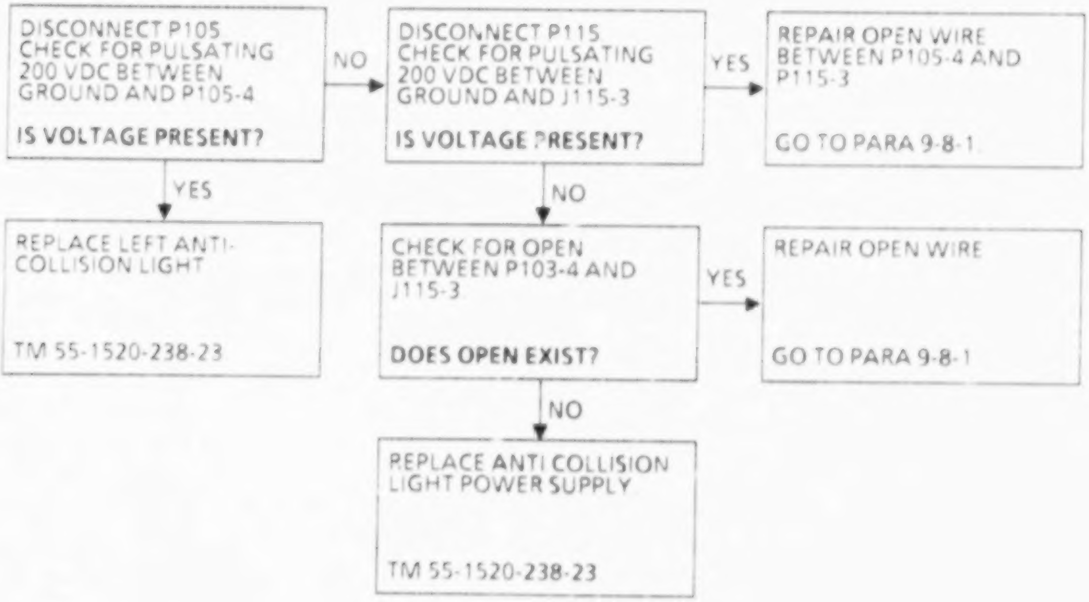
Equipment Conditions: (para 9-8-8)

WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P105 CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P105-4
IS VOLTAGE PRESENT?
NO
DISCONNECT P115 CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND J115-3
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN P105-4 AND P115-3
GO TO PARA 9-8-1
YES
REPLACE LEFT ANTI-COLLISION LIGHT
TM 55-1520-238-23
NO
CHECK FOR OPEN BETWEEN P103-4 AND J115-3
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-8-1
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY
TM 55-1520-238-23

END OF TASK

9-8-11. RIGHT WING WHITE ANTI-COLLISION LIGHT - DOES NOT FUNCTION

Tools: (para 9-8-8)

Personnel Required: (para 9-8-8)

References: (para 9-8-8)

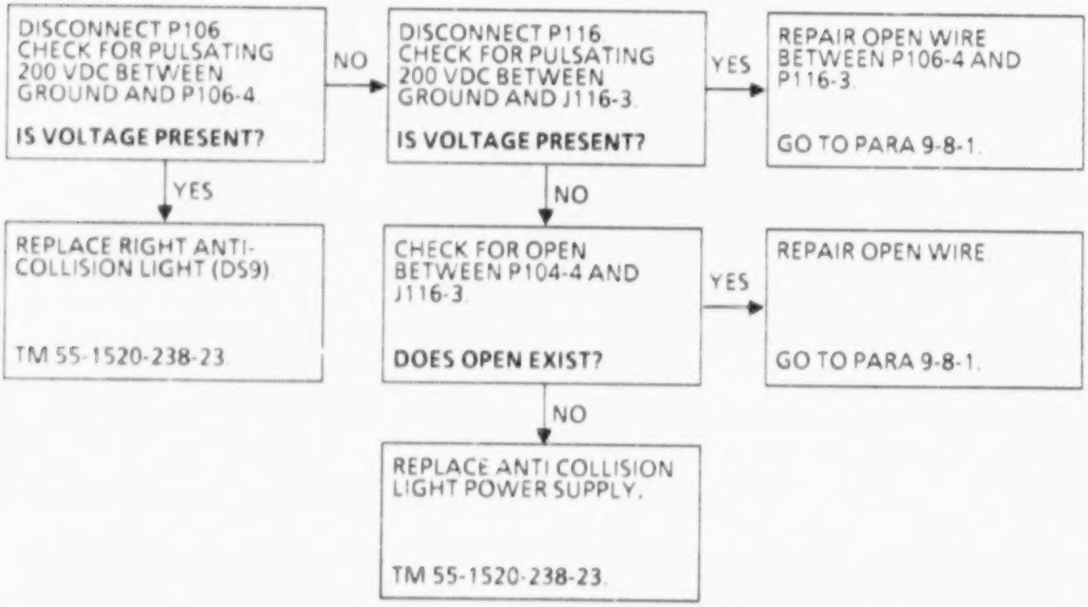
Equipment Conditions: (para 9-8-9)

WARNING

Anti-collision lights are high intensity strobe lights. Excessive viewing of lights could cause temporary blindness.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P106. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND P106-4.
IS VOLTAGE PRESENT?
NO
DISCONNECT P116. CHECK FOR PULSATING 200 VDC BETWEEN GROUND AND J116-3.
IS VOLTAGE PRESENT?
YES
REPAIR OPEN WIRE BETWEEN P106-4 AND P116-3.
GO TO PARA 9-8-1.
YES
REPLACE RIGHT ANTI-COLLISION LIGHT (DS9)
TM 55-1520-238-23
NO
CHECK FOR OPEN BETWEEN P104-4 AND J116-3.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-8-1.
NO
REPLACE ANTI COLLISION LIGHT POWER SUPPLY.
TM 55-1520-238-23.

END OF TASK

9-9-1. LANDING/SEARCH LIGHT - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

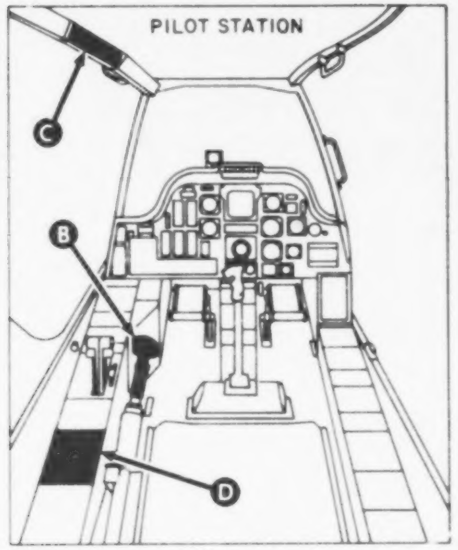
68F10 Aircraft Electrician

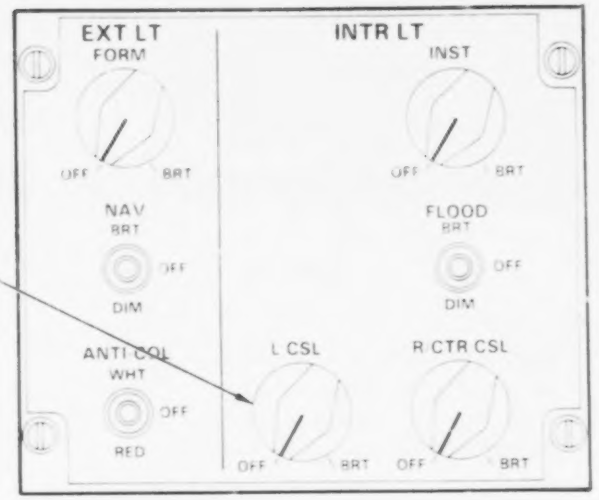
References:

TM 55-1520-238-23

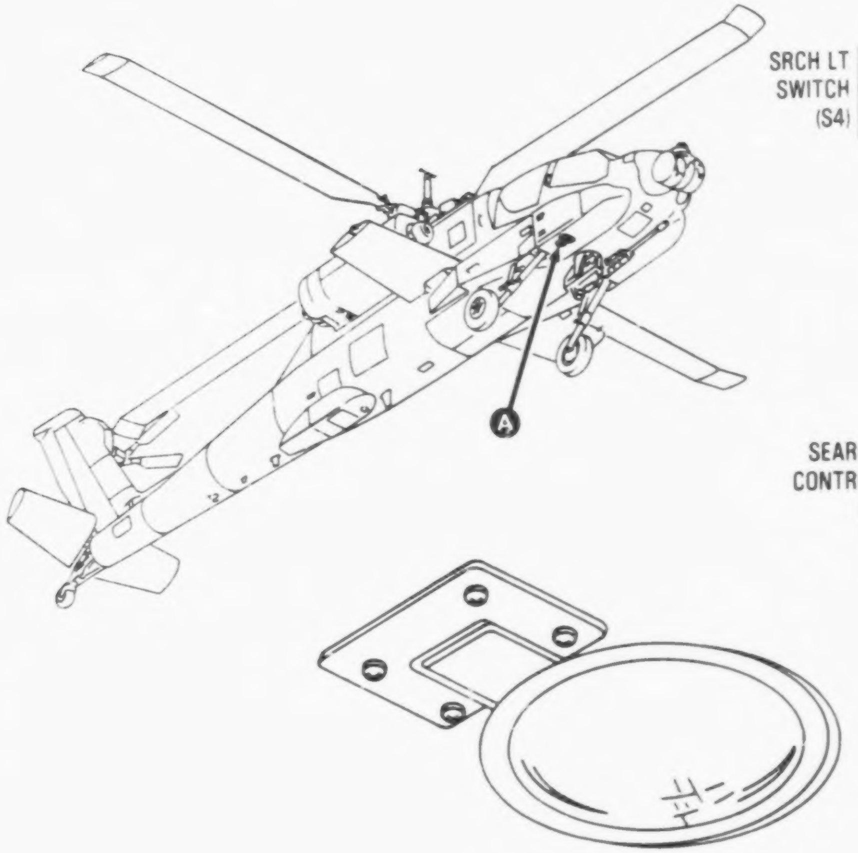
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

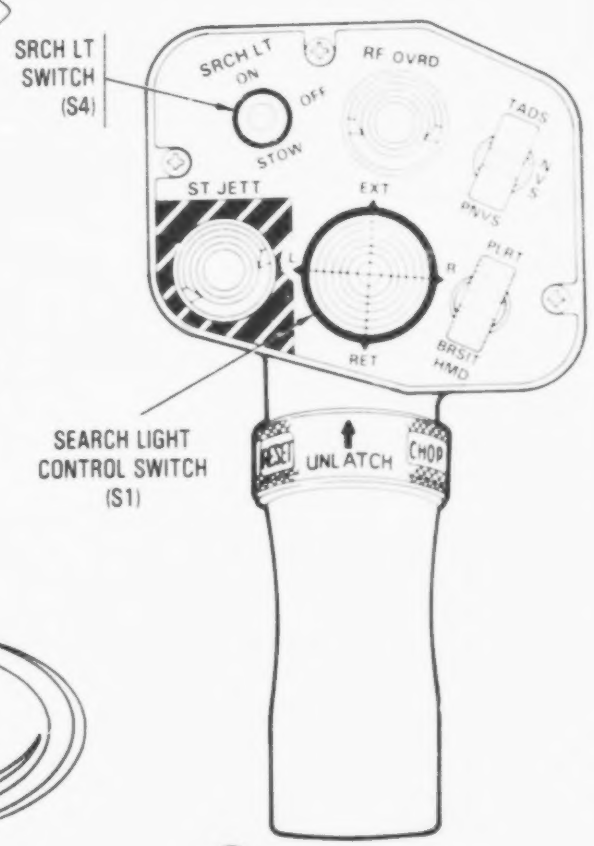




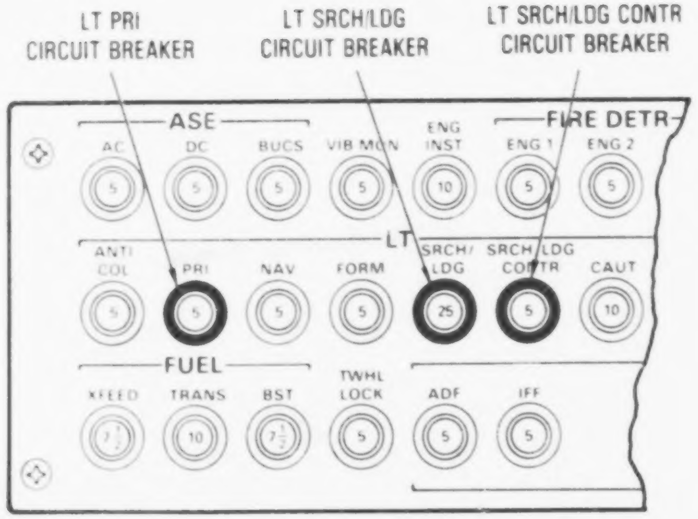
Ⓓ PILOT EXT LT/INTR LT PANEL



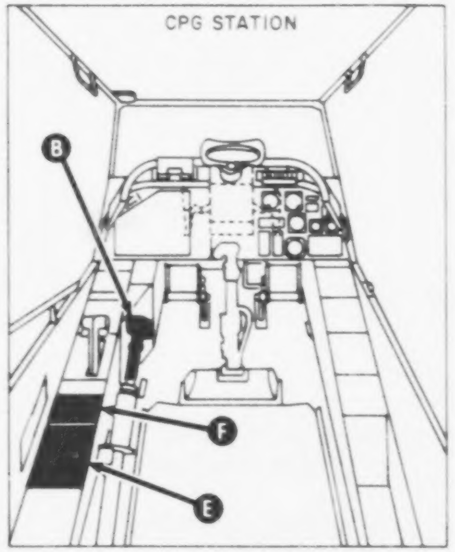
Ⓐ LANDING/SEARCH LIGHT



Ⓑ COLLECTIVE STICK (TYPICAL)



Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL



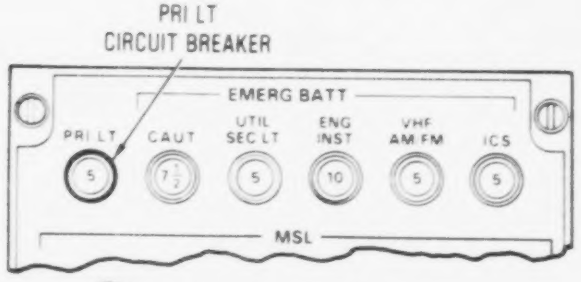
MM04/1-1023-1A

GO TO NEXT PAGE

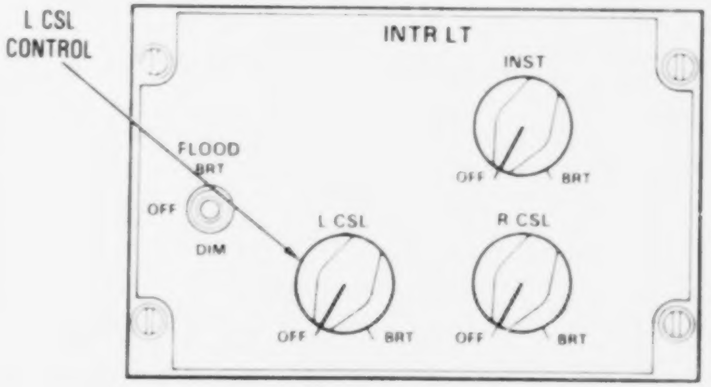
9-9-1. LANDING/SEARCH LIGHT - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that **LT SRCH/LDG**, **LT SRCH/LDG CONTR**, and **LT PRI** circuit breakers are closed.	If **LT SRCH/LDG** circuit breaker does not stay closed, go to para 9-9-4. If **LT SRCH/LDG CONTR** circuit breaker does not stay closed, go to para 9-9-5. If **LT PRI** circuit breaker does not stay closed, go to para 9-13-1.
2. On CPG circuit breaker panel No. 1, check that **PRI LT** circuit breaker is closed.	If **PRI LT** circuit breaker does not stay closed, go to para 9-14-1.
3. On pilot collective stick, hold search light control switch (S1) in **EXT**. Check that landing/search light is extended.	If landing/search light is not extended, go to para 9-9-6.
4. On pilot collective stick, hold S1 in **L**. Check that landing/search light rotates to the left 180 degrees.	If landing/search light does not rotate to the left 180 degrees, go to para 9-9-7.
5. On pilot collective stick, set **SRCH LT** switch (S4) to **ON**. Check that **LT SRCH/LDG** circuit breaker is closed and landing/search light is lighted.	If **LT SRCH/LDG** circuit breaker does not stay closed, go to para 9-9-4. If landing/search light is not lighted, go to para 9-9-8.
6. On pilot collective stick, hold S1 in **R**. Check that landing/search light rotates to the right 180 degrees.	If landing/search light does not rotate to the right 180 degrees, go to para 9-9-9.
7. On pilot collective stick, hold S1 in **RET**. Check that landing/search light is retracted and not lighted.	If landing/search light is not retracted or is lighted, go to para 9-9-10.
8. With landing/search light extended on pilot collective stick, hold S4 in **STOW** and return to **OFF**. Check that landing/search light is stowed.	If landing/search light is not stowed, go to para 9-9-11.
9. On pilot **EXT LT/INTR LT** panel, set **L CSL** control to **BRT**. Check that pilot collective stick edge-light is lighted.	If pilot collective stick edge-light is not lighted, go to para 9-9-12.
10. On CPG collective stick, hold S1 in **EXT**. Check that landing/search light is extended.	If landing/search light is not extended, go to para 9-9-13.
11. On CPG collective stick, hold S1 in **L**. Check that landing/search light rotates to the left 180 degrees.	If landing/search light does not rotate to the left 180 degrees, go to para 9-9-14.
12. On CPG collective stick, hold S1 in **R**. Check that landing/search light rotates to the right 180 degrees.	If landing/search light does not rotate to the right 180 degrees, go to para 9-9-15.
13. On CPG collective stick, set S4 to **ON**. Check that landing/search light is lighted.	If landing/search light is not lighted, go to para 9-9-16.
14. On CPG collective stick, hold S1 in **RET**. Check that landing/search light is retracted and not lighted.	If landing/search light is not retracted, or is lighted, go to para 9-9-17.
15. With landing/search light extended, on CPG collective stick, hold S4 in **STOW** and then to **OFF**. Check that landing/search light is stowed.	If landing/search light is not stowed, go to para 9-9-18.
16. On CPG **INTR LT** panel, set **L CSL** control to **BRT**. Check that CPG collective stick edge-light is lighted.	If CPG collective stick edge-light is not lighted, go to para 9-9-19.



E CPG CIRCUIT BREAKER PANEL NO. 1



F CPG INTR LT PANEL

MM04/1-1023-2

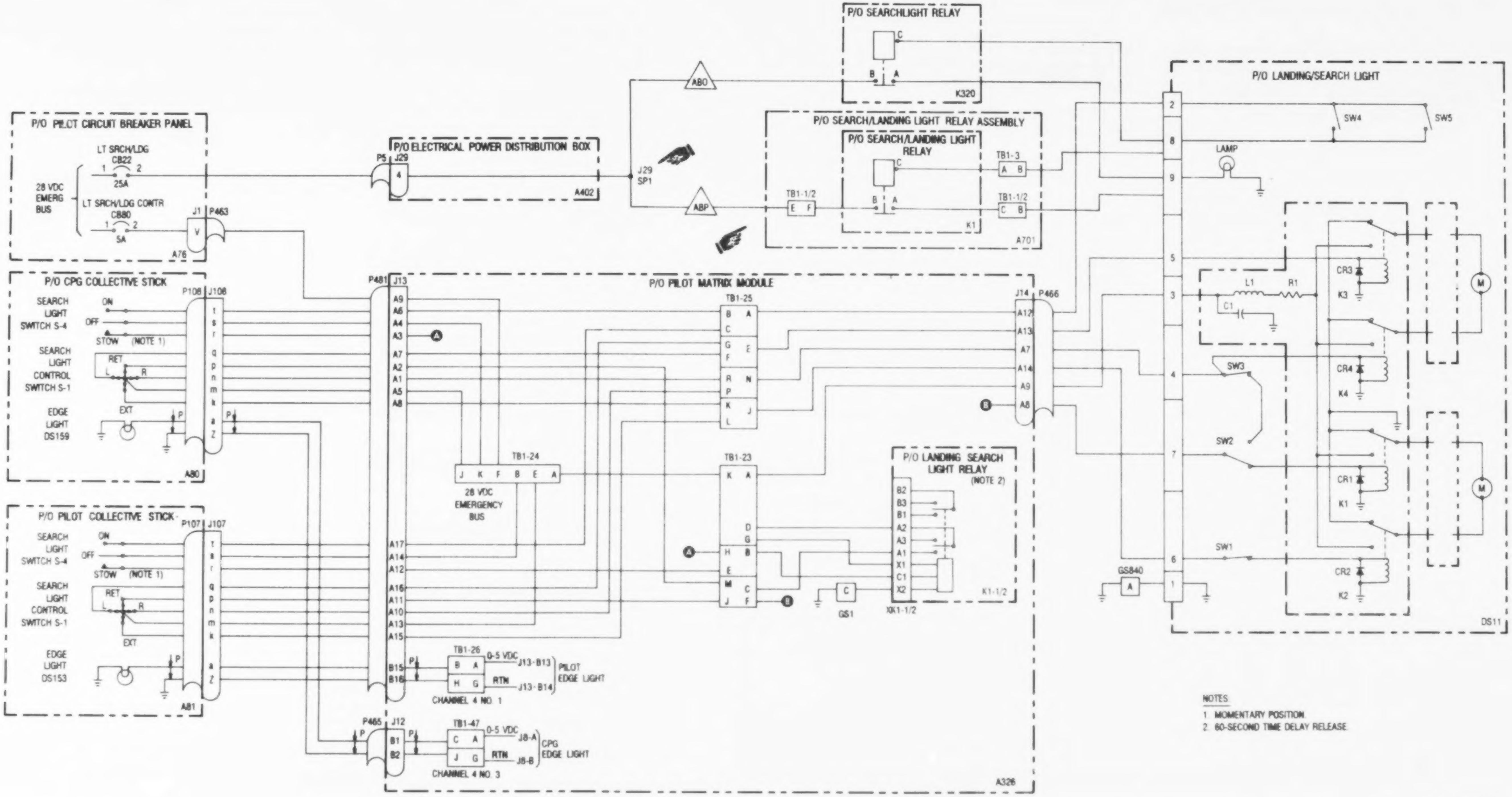
B. On CPG **INTR LT** panel, turn **L CSL** control to **OFF**.

C. On pilot **EXT LT/INTR LT** panel, turn **L CSL** control to **OFF**.

D. Perform **EXTERNAL POWER - POWER DOWN** (para 9-5-3).

END OF TASK

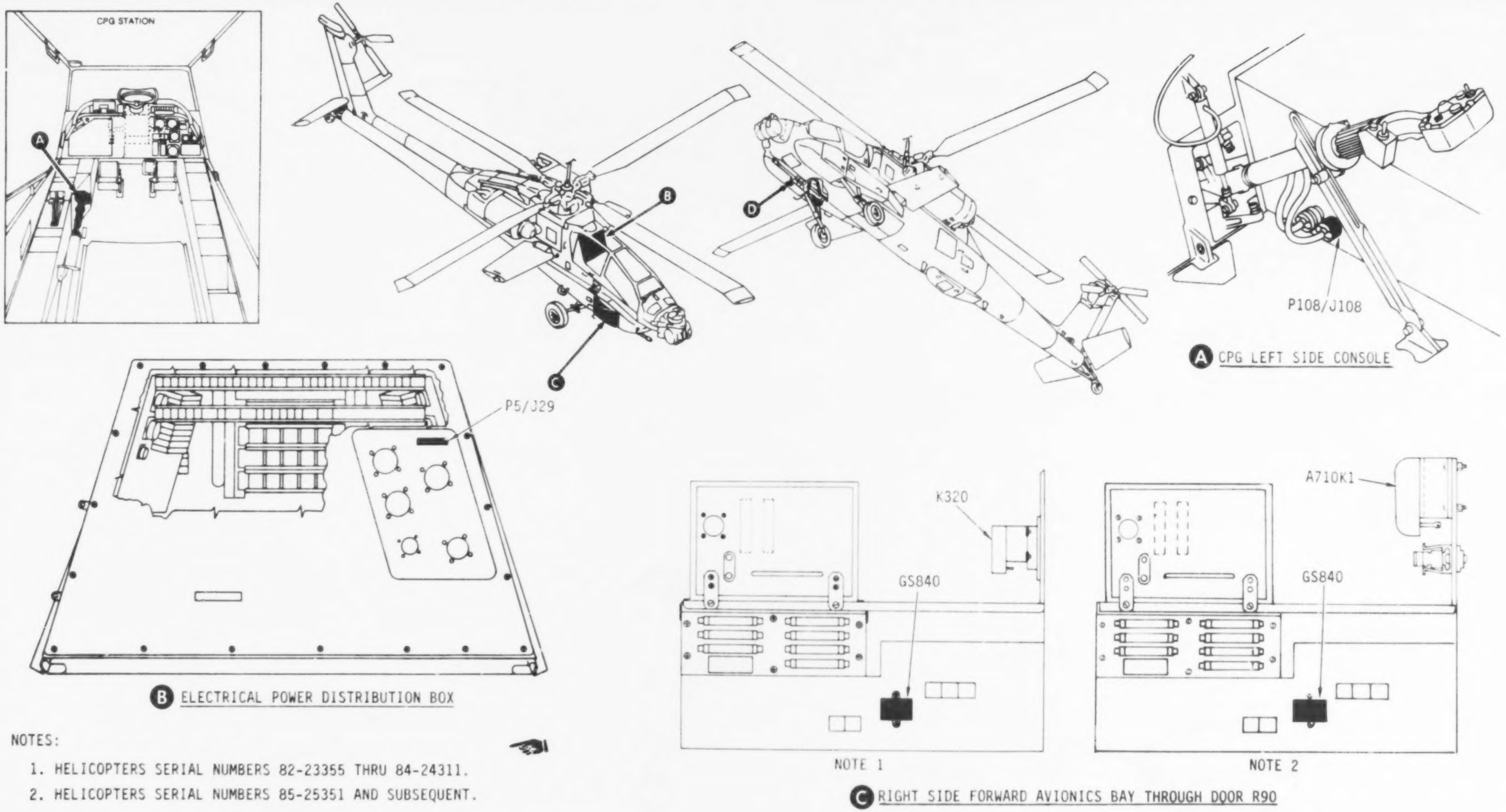
9-9-2. LANDING/SEARCH LIGHT - INTERCONNECTION DIAGRAM



NOTES:
1. MOMENTARY POSITION.
2. 60-SECOND TIME DELAY RELEASE.

MM04/1-729E

9-9-3. LANDING/SEARCH LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



A CPG LEFT SIDE CONSOLE

B ELECTRICAL POWER DISTRIBUTION BOX

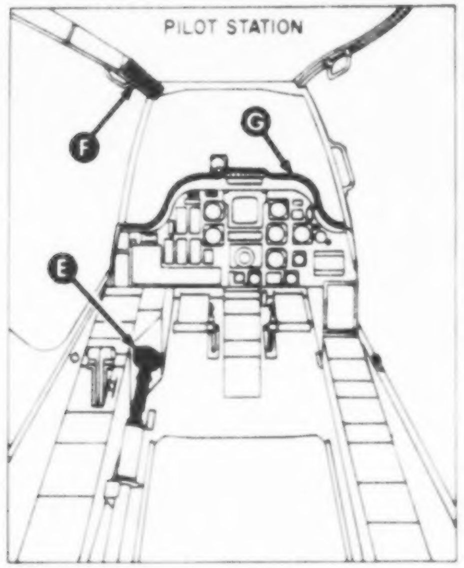
C RIGHT SIDE FORWARD AVIONICS BAY THROUGH DOOR R90

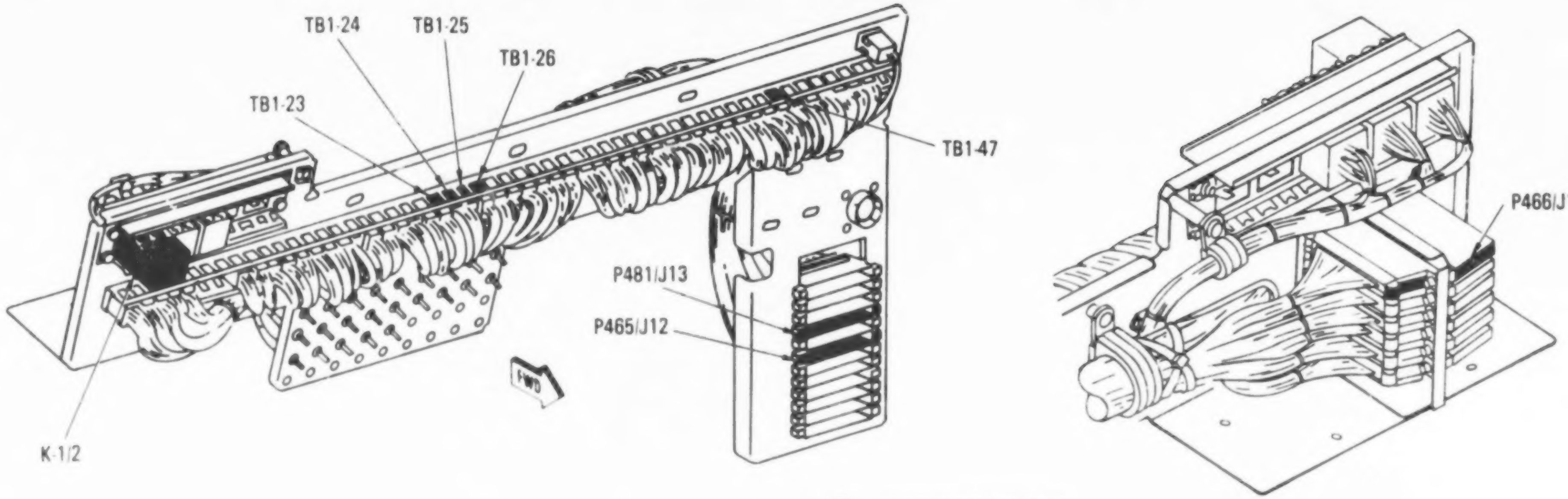
NOTES:

1. HELICOPTERS SERIAL NUMBERS 82-23355 THRU 84-24311.
2. HELICOPTERS SERIAL NUMBERS 85-25351 AND SUBSEQUENT.

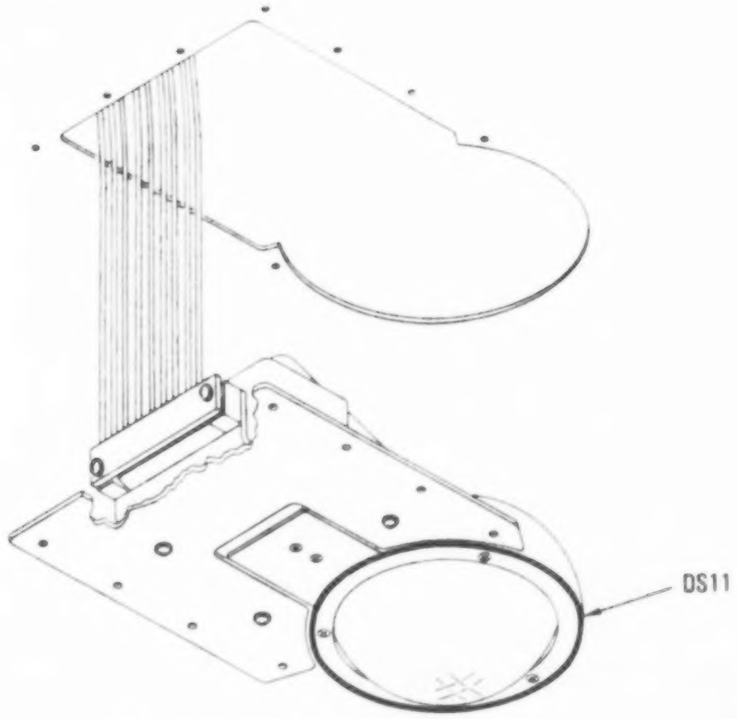
MM04/1-1218-1C

9-9-3. LANDING/SEARCH LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

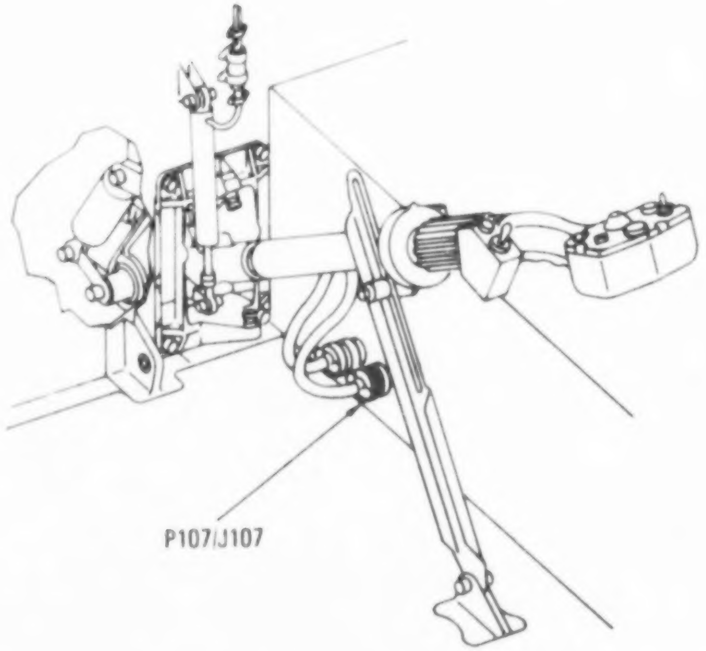




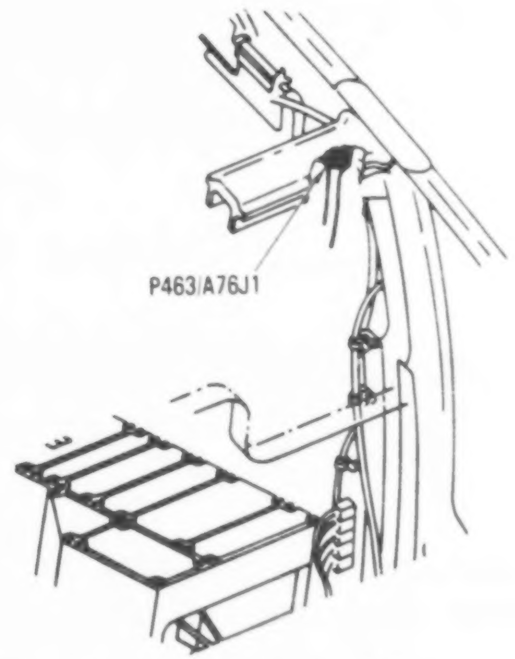
G PILOT MATRIX MODULE



D LANDING/SEARCH LIGHT REMOVED



E PILOT LEFT SIDE CONSOLE



F PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1218-2A

9-9-4. LT SRCH/LDG CIRCUIT BREAKER (CB22) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-00-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

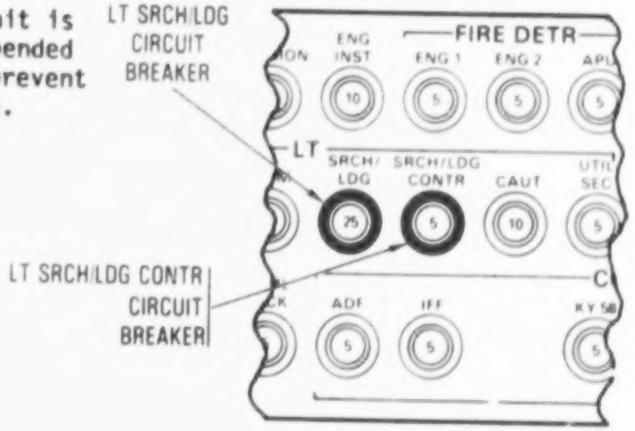
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

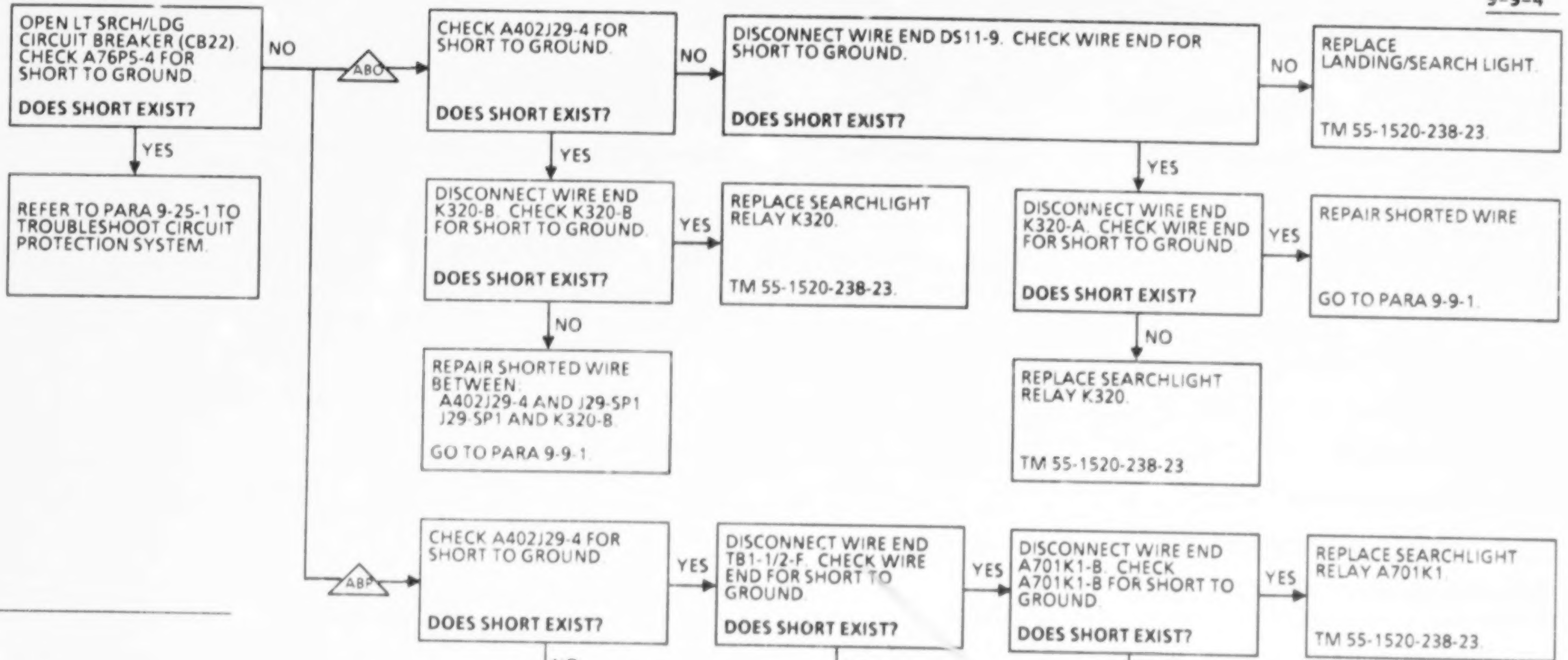
CAUTION

If access to searchlight unit is required, unit must be suspended with suitable lockwire to prevent damage to electrical wiring.



PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1220



OPEN LT SRCH/LDG CIRCUIT BREAKER (CB22). CHECK A76P5-4 FOR SHORT TO GROUND.
DOES SHORT EXIST?

REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

CHECK A402J29-4 FOR SHORT TO GROUND.
DOES SHORT EXIST?

DISCONNECT WIRE END DS11-9. CHECK WIRE END FOR SHORT TO GROUND.
DOES SHORT EXIST?

REPLACE LANDING/SEARCH LIGHT.
TM 55-1520-238-23.

DISCONNECT WIRE END K320-B. CHECK K320-B FOR SHORT TO GROUND.
DOES SHORT EXIST?

REPLACE SEARCHLIGHT RELAY K320.
TM 55-1520-238-23.

DISCONNECT WIRE END K320-A. CHECK WIRE END FOR SHORT TO GROUND.
DOES SHORT EXIST?

REPAIR SHORTED WIRE
GO TO PARA 9-9-1.

REPAIR SHORTED WIRE BETWEEN:
A402J29-4 AND J29-SP1
J29-SP1 AND K320-B.
GO TO PARA 9-9-1.

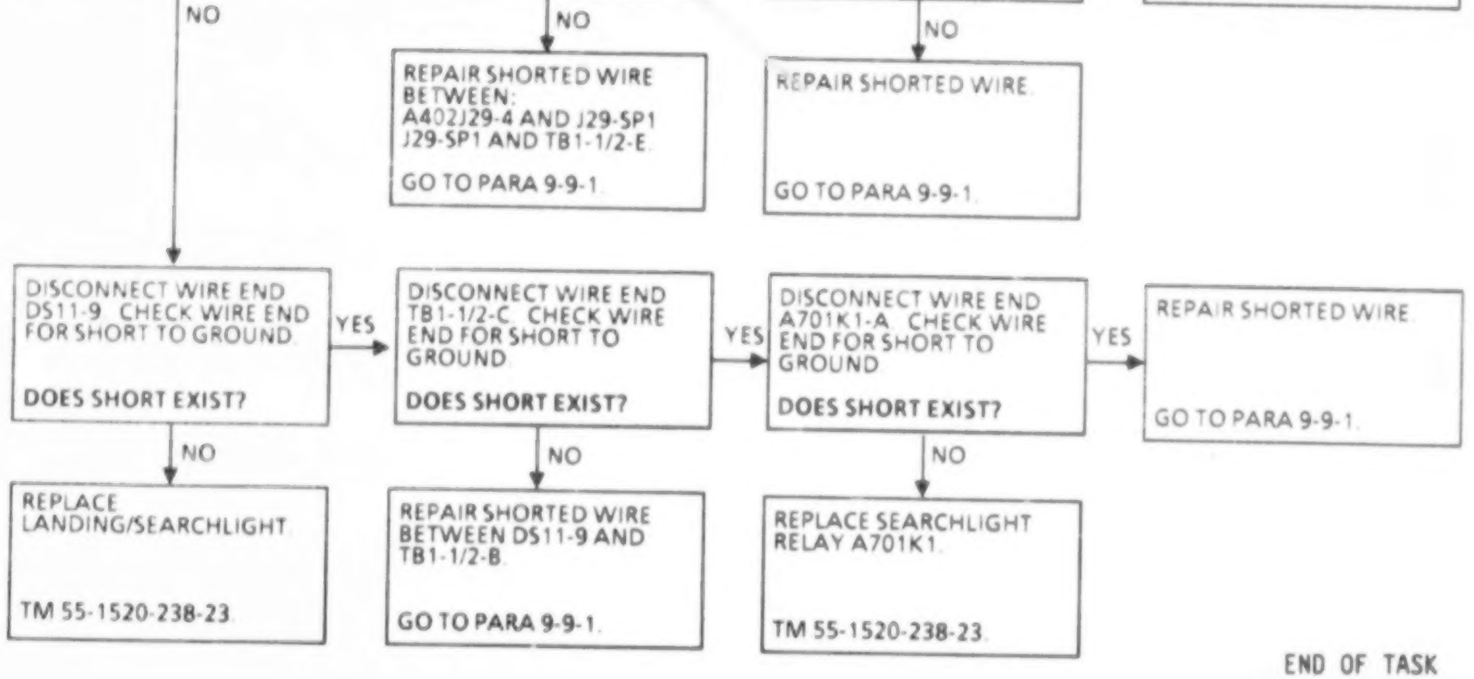
REPLACE SEARCHLIGHT RELAY K320.
TM 55-1520-238-23

CHECK A402J29-4 FOR SHORT TO GROUND.
DOES SHORT EXIST?

DISCONNECT WIRE END TB1-1/2-F. CHECK WIRE END FOR SHORT TO GROUND.
DOES SHORT EXIST?

DISCONNECT WIRE END A701K1-B. CHECK A701K1-B FOR SHORT TO GROUND.
DOES SHORT EXIST?

REPLACE SEARCHLIGHT RELAY A701K1.
TM 55-1520-238-23.



REPAIR SHORTED WIRE BETWEEN:
A402J29-4 AND J29-SP1
J29-SP1 AND TB1-1/2-E.
GO TO PARA 9-9-1.

REPAIR SHORTED WIRE.
GO TO PARA 9-9-1.

DISCONNECT WIRE END DS11-9. CHECK WIRE END FOR SHORT TO GROUND.
DOES SHORT EXIST?

DISCONNECT WIRE END TB1-1/2-C. CHECK WIRE END FOR SHORT TO GROUND.
DOES SHORT EXIST?

DISCONNECT WIRE END A701K1-A. CHECK WIRE END FOR SHORT TO GROUND.
DOES SHORT EXIST?

REPAIR SHORTED WIRE.
GO TO PARA 9-9-1.

REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN DS11-9 AND TB1-1/2-B.
GO TO PARA 9-9-1.

REPLACE SEARCHLIGHT RELAY A701K1.
TM 55-1520-238-23.

END OF TASK

9-9-5. LT SRCH/LDG CONTR CIRCUIT BREAKER (CB80) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

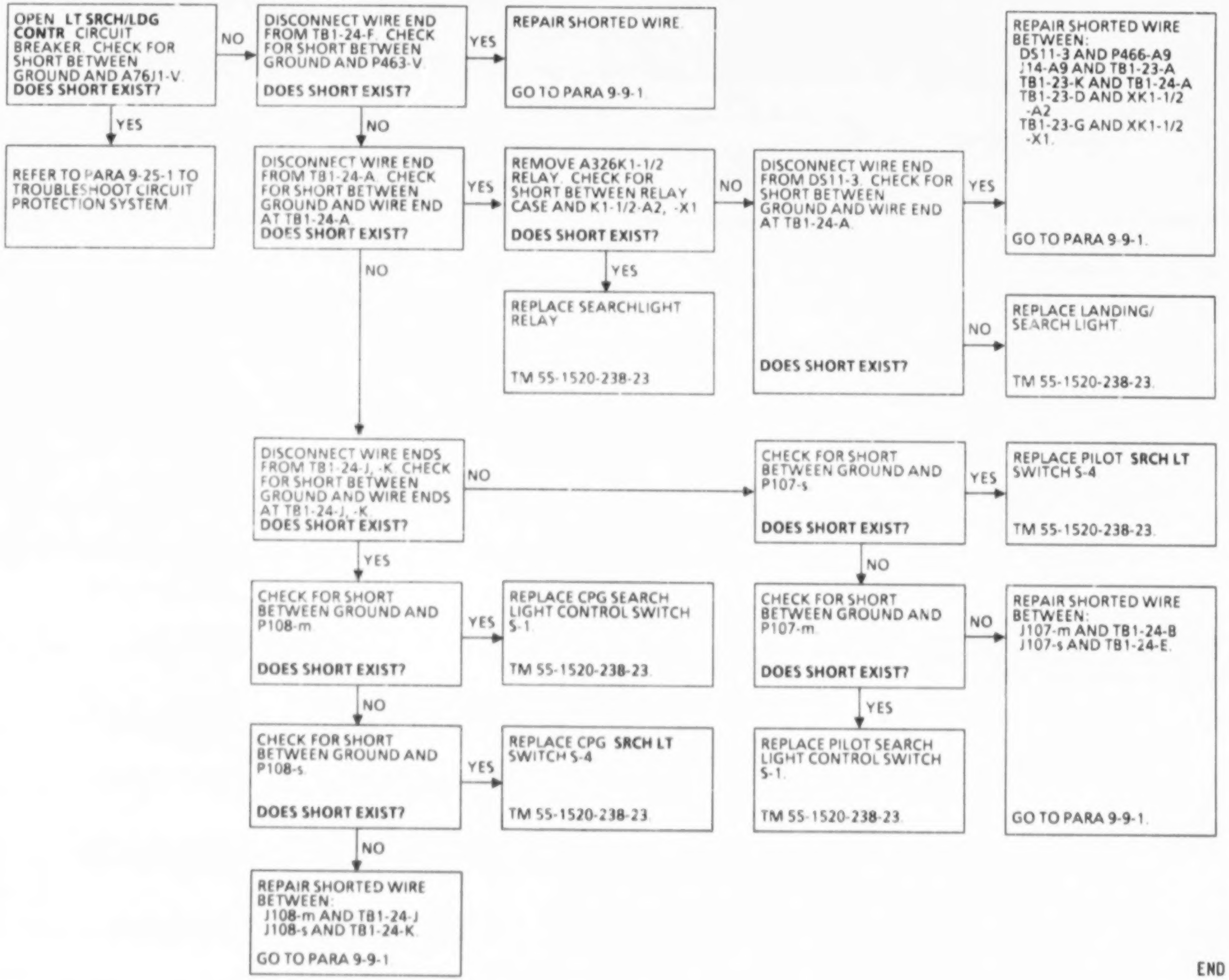
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT SRCH/LDG CONTR CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76J1-V. DOES SHORT EXIST?
NO
YES
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
DISCONNECT WIRE END FROM TB1-24-F. CHECK FOR SHORT BETWEEN GROUND AND P463-V. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-9-1.
NO
DISCONNECT WIRE END FROM TB1-24-A. CHECK FOR SHORT BETWEEN GROUND AND WIRE END AT TB1-24-A. DOES SHORT EXIST?
YES
REMOVE A326K1-1/2 RELAY. CHECK FOR SHORT BETWEEN RELAY CASE AND K1-1/2-A2, -X1. DOES SHORT EXIST?
YES
REPLACE SEARCHLIGHT RELAY. TM 55-1520-238-23
NO
DISCONNECT WIRE END FROM DS11-3. CHECK FOR SHORT BETWEEN GROUND AND WIRE END AT TB1-24-A. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: DS11-3 AND P466-A9 J14-A9 AND TB1-23-A TB1-23-K AND TB1-24-A TB1-23-D AND XK1-1/2 -A2 TB1-23-G AND XK1-1/2 -X1. GO TO PARA 9-9-1.
NO
REPLACE LANDING/ SEARCH LIGHT. TM 55-1520-238-23.
NO
DISCONNECT WIRE ENDS FROM TB1-24-J, -K. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS AT TB1-24-J, -K. DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P107-s. DOES SHORT EXIST?
YES
REPLACE PILOT SRCH LT SWITCH S-4. TM 55-1520-238-23.
NO
CHECK FOR SHORT BETWEEN GROUND AND P107-m. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN: J107-m AND TB1-24-B J107-s AND TB1-24-E. GO TO PARA 9-9-1.
YES
REPLACE PILOT SEARCH LIGHT CONTROL SWITCH S-1. TM 55-1520-238-23.
YES
CHECK FOR SHORT BETWEEN GROUND AND P108-m. DOES SHORT EXIST?
YES
REPLACE CPG SEARCH LIGHT CONTROL SWITCH S-1. TM 55-1520-238-23.
NO
CHECK FOR SHORT BETWEEN GROUND AND P108-s. DOES SHORT EXIST?
YES
REPLACE CPG SRCH LT SWITCH S-4. TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN: J108-m AND TB1-24-J J108-s AND TB1-24-K. GO TO PARA 9-9-1.

END OF TASK

9-9-6. PILOT COLLECTIVE STICK - DOES NOT EXTEND LANDING/SEARCHLIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

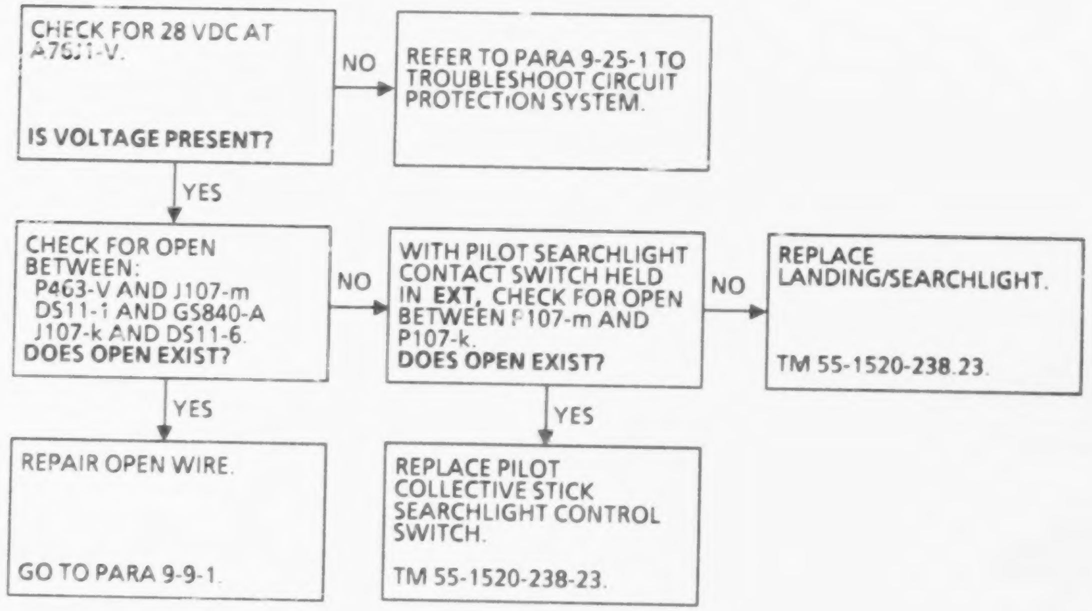
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT A76J1-V.
IS VOLTAGE PRESENT?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN: P463-V AND J107-m DS11-1 AND GS840-A J107-k AND DS11-6.
DOES OPEN EXIST?
NO
WITH PILOT SEARCHLIGHT CONTACT SWITCH HELD IN EXT, CHECK FOR OPEN BETWEEN P107-m AND P107-k.
DOES OPEN EXIST?
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238.23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.

END OF TASK

9-9-7. PILOT COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCHLIGHT TO THE LEFT

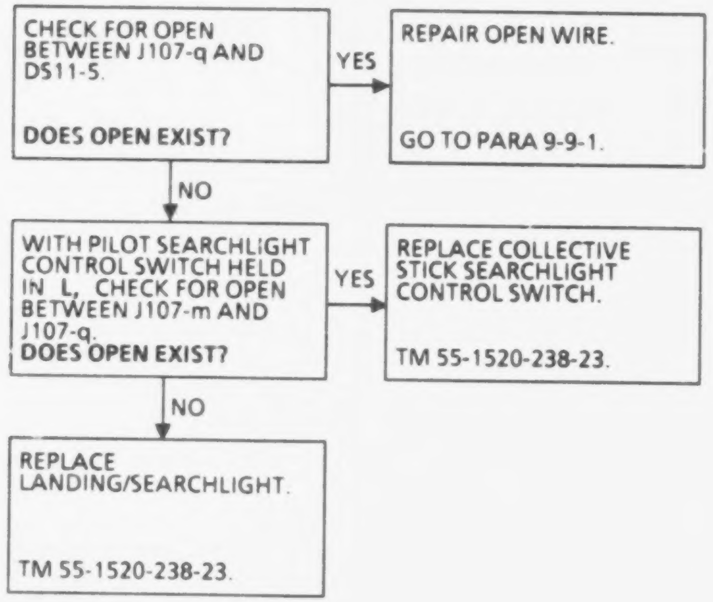
Tools: (para 9-9-6)

Personnel Required: (para 9-9-6)

References: (para 9-9-6)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Crew station seat removed (pilot)


CHECK FOR OPEN BETWEEN J107-q AND DS11-5.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN L, CHECK FOR OPEN BETWEEN J107-m AND J107-q.
DOES OPEN EXIST?
YES
REPLACE COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

END OF TASK

9-9-8. PILOT COLLECTIVE STICK - DOES NOT ACTIVATE LANDING/SEARCH LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

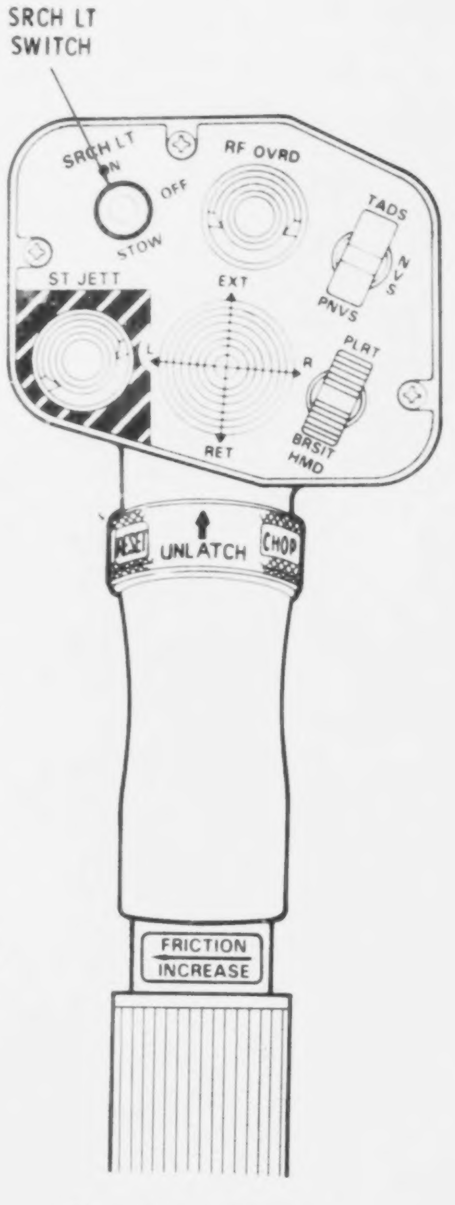
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

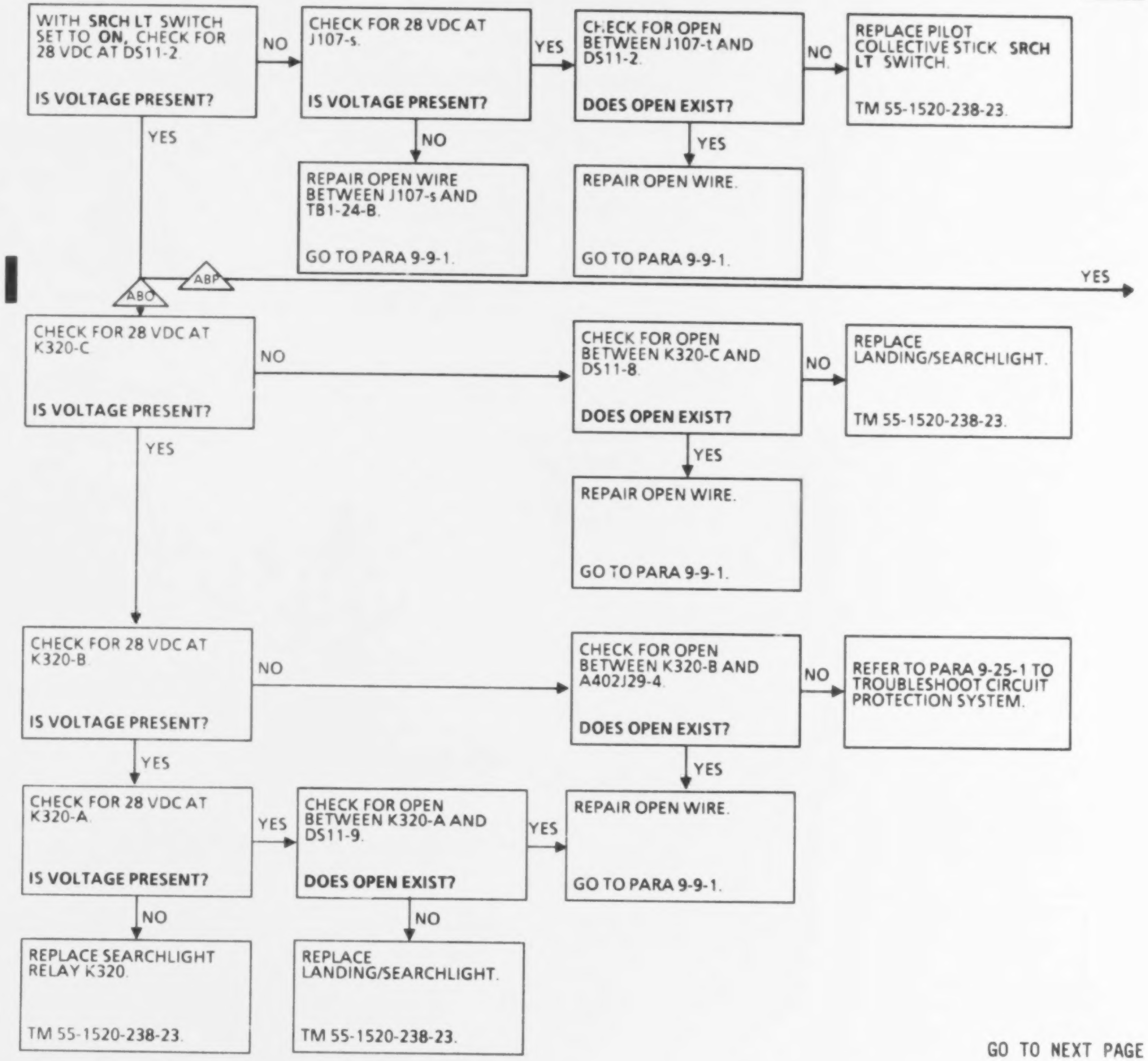
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



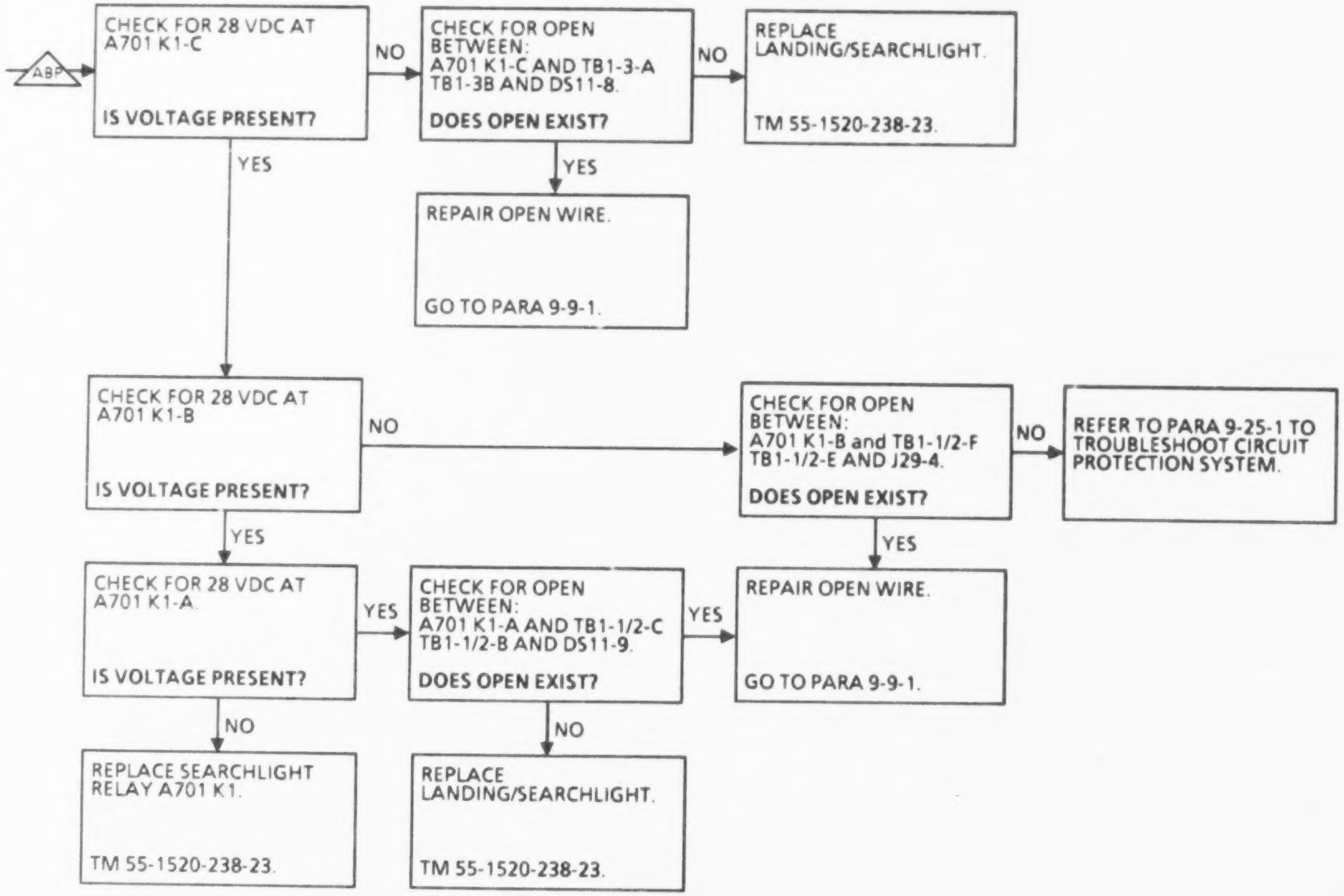
PILOT COLLECTIVE STICK

MM04/1-1222A


WITH SRCH LT SWITCH SET TO ON, CHECK FOR 28 VDC AT DS11-2. IS VOLTAGE PRESENT?
NO
CHECK FOR 28 VDC AT J107-s. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN J107-t AND DS11-2. DOES OPEN EXIST?
NO
REPLACE PILOT COLLECTIVE STICK SRCH LT SWITCH. TM 55-1520-238-23.
NO
REPAIR OPEN WIRE BETWEEN J107-s AND TB1-24-B. GO TO PARA 9-9-1.
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.
YES
ABO
ABP
YES
CHECK FOR 28 VDC AT K320-C. IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN K320-C AND DS11-8. DOES OPEN EXIST?
NO
REPLACE LANDING/SEARCHLIGHT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.
YES
CHECK FOR 28 VDC AT K320-B. IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN K320-B AND A402J29-4. DOES OPEN EXIST?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
YES
CHECK FOR 28 VDC AT K320-A. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN K320-A AND DS11-9. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.
NO
REPLACE SEARCHLIGHT RELAY K320. TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT. TM 55-1520-238-23.

GO TO NEXT PAGE

9-9-8. PILOT COLLECTIVE STICK - DOES NOT ACTIVATE LANDING/SEARCH LIGHT (cont)


ABP
CHECK FOR 28 VDC AT A701 K1-C
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: A701 K1-C AND TB1-3-A TB1-3B AND DS11-8.
DOES OPEN EXIST?
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
CHECK FOR 28 VDC AT A701 K1-B
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN BETWEEN: A701 K1-B and TB1-1/2-F TB1-1/2-E AND J29-4.
DOES OPEN EXIST?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
YES
CHECK FOR 28 VDC AT A701 K1-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: A701 K1-A AND TB1-1/2-C TB1-1/2-B AND DS11-9.
DOES OPEN EXIST?
YES
NO
REPLACE SEARCHLIGHT RELAY A701 K1.
TM 55-1520-238-23.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.

END OF TASK

9-9-9. PILOT COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO THE RIGHT

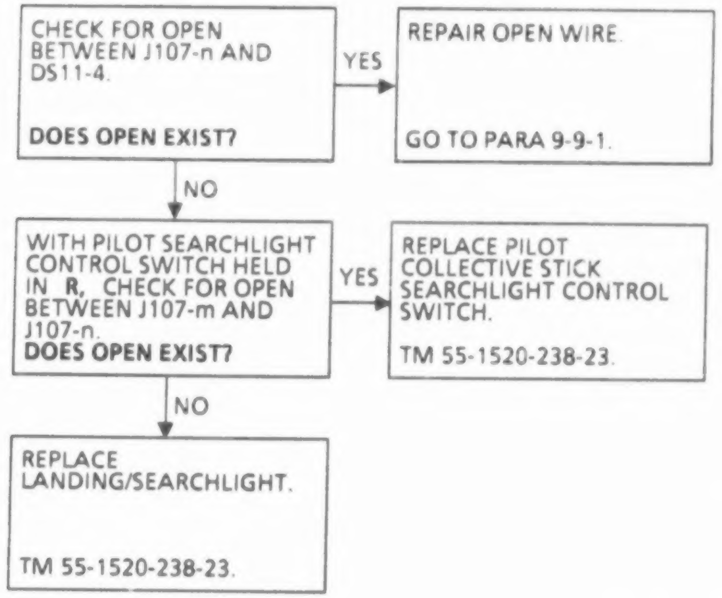
Tools: (para 9-9-8)

Personnel Required: (para 9-9-8)

References: (para 9-9-8)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat removed (pilot)



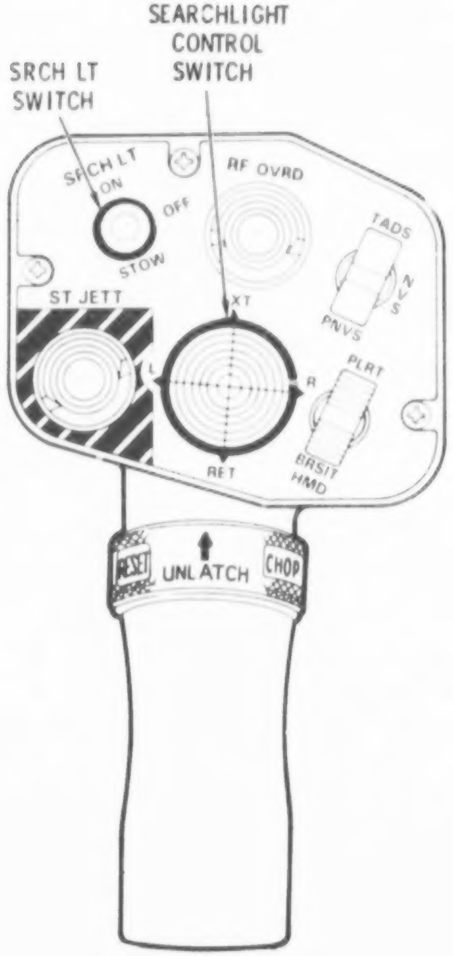
CHECK FOR OPEN BETWEEN J107-n AND DS11-4.
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-9-1.

NO: WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN **R**, CHECK FOR OPEN BETWEEN J107-m AND J107-n.
DOES OPEN EXIST?

YES: REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

NO: REPLACE LANDING/SEARCHLIGHT. TM 55-1520-238-23.



PILOT COLLECTIVE STICK

MM04/1-1223A

END OF TASK

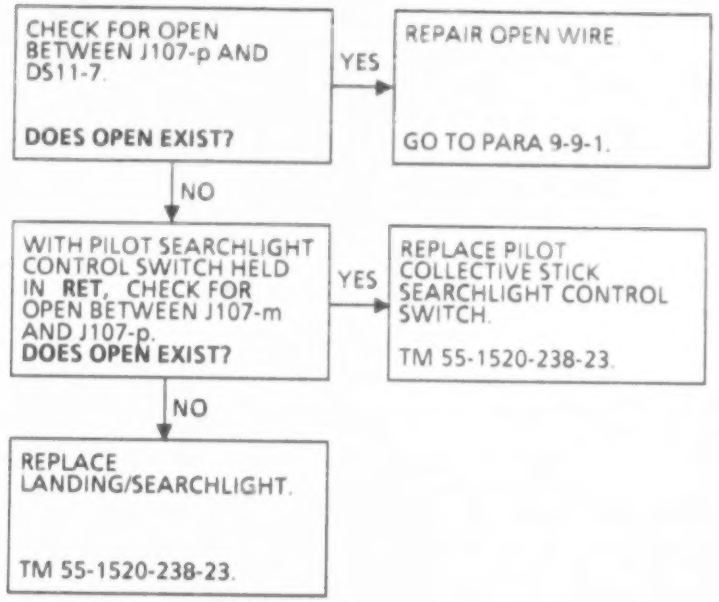
9-9-10. PILOT COLLECTIVE STICK - DOES NOT RETRACT LANDING/SEARCH LIGHT

Tools: (para 9-9-8)

Personnel Required: (para 9-9-8)

References: (para 9-9-8)

Equipment Conditions: (para 9-9-9)



CHECK FOR OPEN BETWEEN J107-p AND DS11-7.
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-9-1.

NO: WITH PILOT SEARCHLIGHT CONTROL SWITCH HELD IN **RET**, CHECK FOR OPEN BETWEEN J107-m AND J107-p.
DOES OPEN EXIST?

YES: REPLACE PILOT COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

NO: REPLACE LANDING/SEARCHLIGHT. TM 55-1520-238-23.

END OF TASK

9-9-11. PILOT COLLECTIVE STICK - DOES NOT STOW LANDING/SEARCH LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

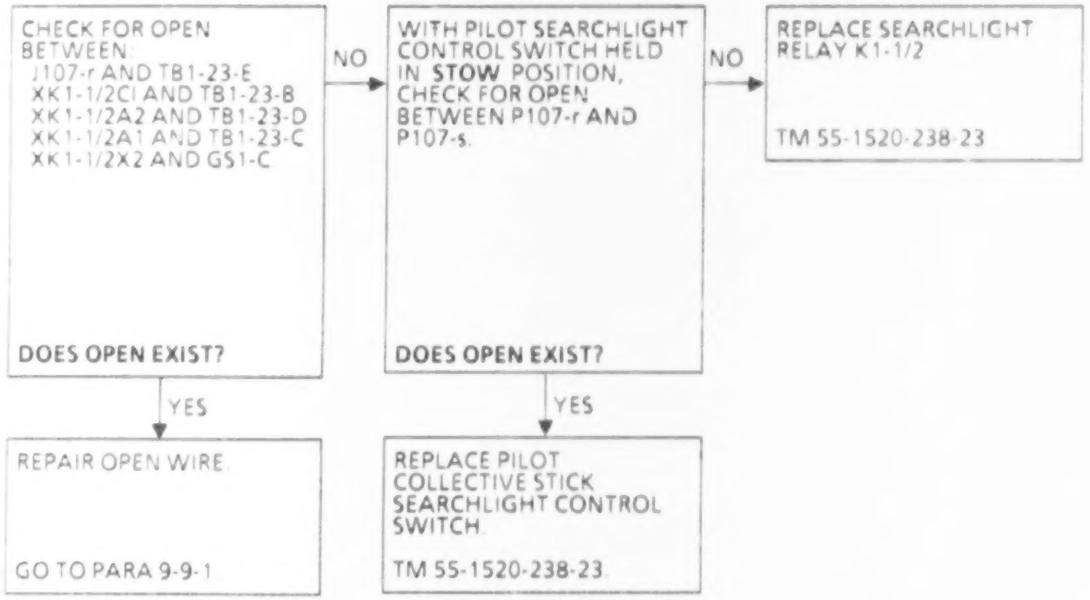
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat (pilot) and nontransparent barrier removed



END OF TASK

9-9-12. PILOT COLLECTIVE STICK EDGE-LIGHT - IS NOT LIGHTED

Tools: (para 9-9-11)

Personnel Required: (para 9-9-11)

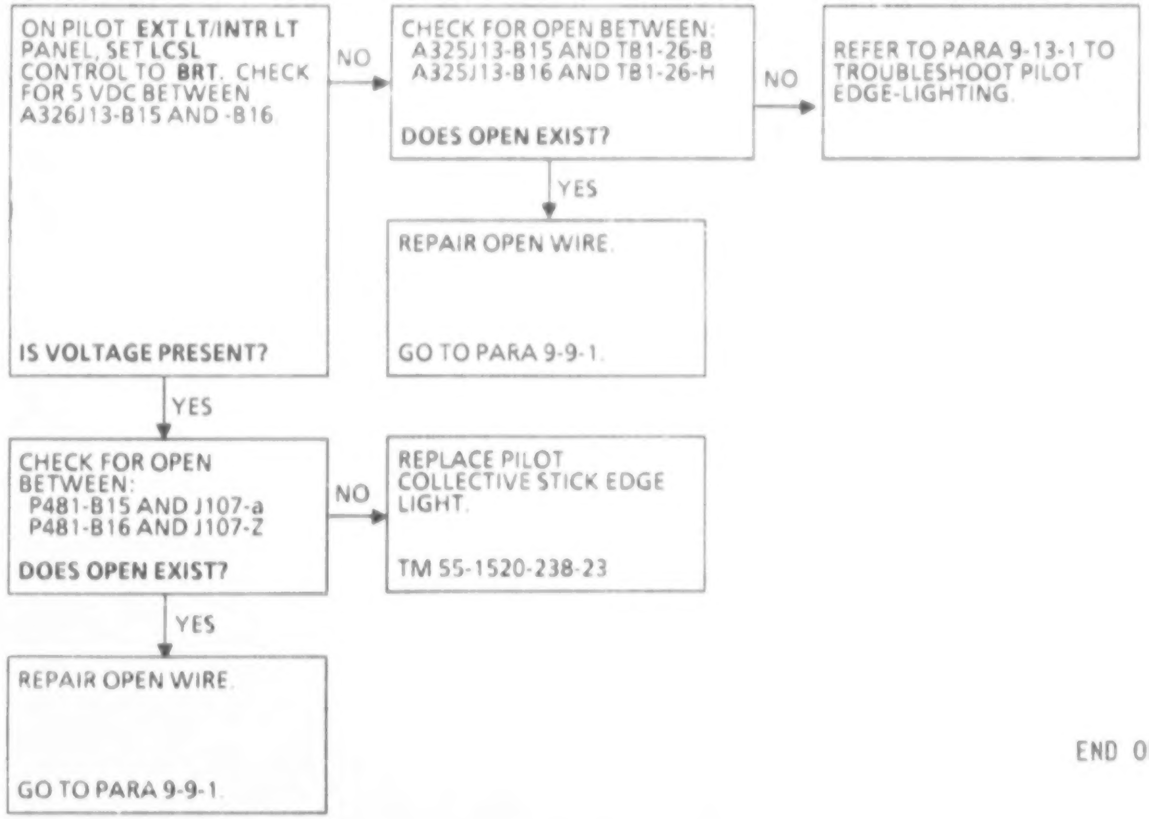
References: (para 9-9-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER POWER UP - completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-9-13. CPG COLLECTIVE STICK - DOES NOT EXTEND LANDING/SEARCH LIGHT

Tools: (para 9-9-11)

Personnel Required: (para 9-9-11)

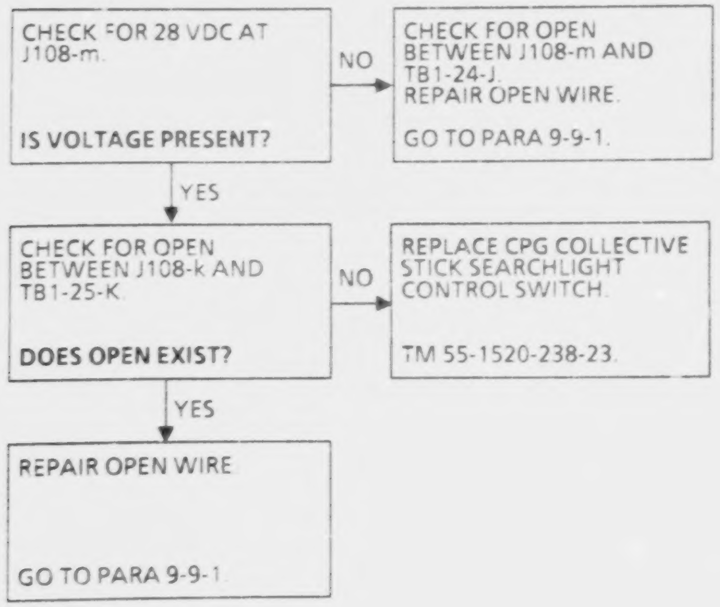
References: (para 9-9-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat removed (cpg)
Para 9-5-2	EXTERNAL POWER - POWER UP competed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



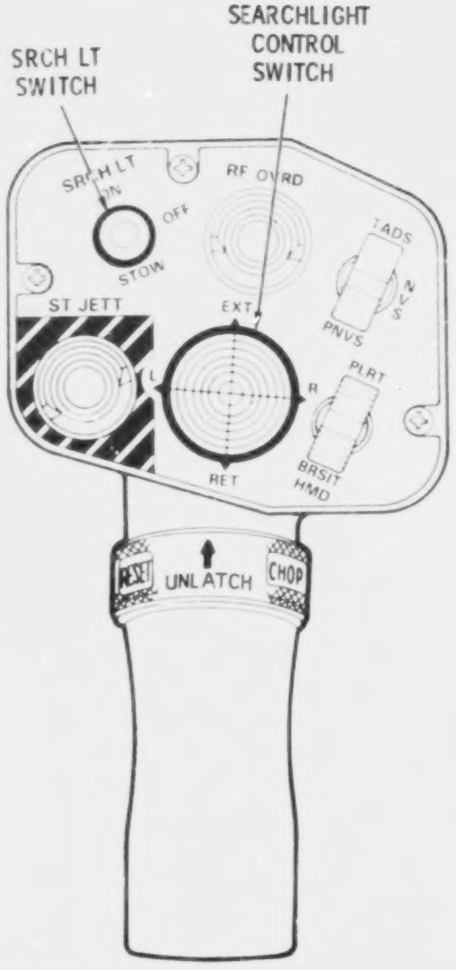
CHECK FOR 28 VDC AT J108-m.
IS VOLTAGE PRESENT?

NO: CHECK FOR OPEN BETWEEN J108-m AND TB1-24-J. REPAIR OPEN WIRE. GO TO PARA 9-9-1.

YES: CHECK FOR OPEN BETWEEN J108-k AND TB1-25-K.
DOES OPEN EXIST?

NO: REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-9-1.



CPG COLLECTIVE STICK

MM04-1-1224A

END OF TASK

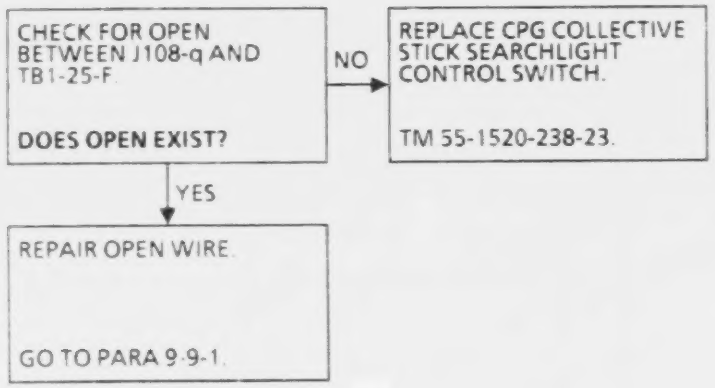
9-9-14. CPG COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO LEFT

Tools: (para 9-9-11)

Personnel Required: (para 9-9-11)

References: (para 9-9-11)

Equipment Conditions: (para 9-9-13)



CHECK FOR OPEN BETWEEN J108-q AND TB1-25-F.
DOES OPEN EXIST?

NO: REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-9-1.

END OF TASK

best copy available

Reproduced from poor document.

9-9-15. CPG COLLECTIVE STICK - DOES NOT ROTATE LANDING/SEARCH LIGHT TO THE RIGHT

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

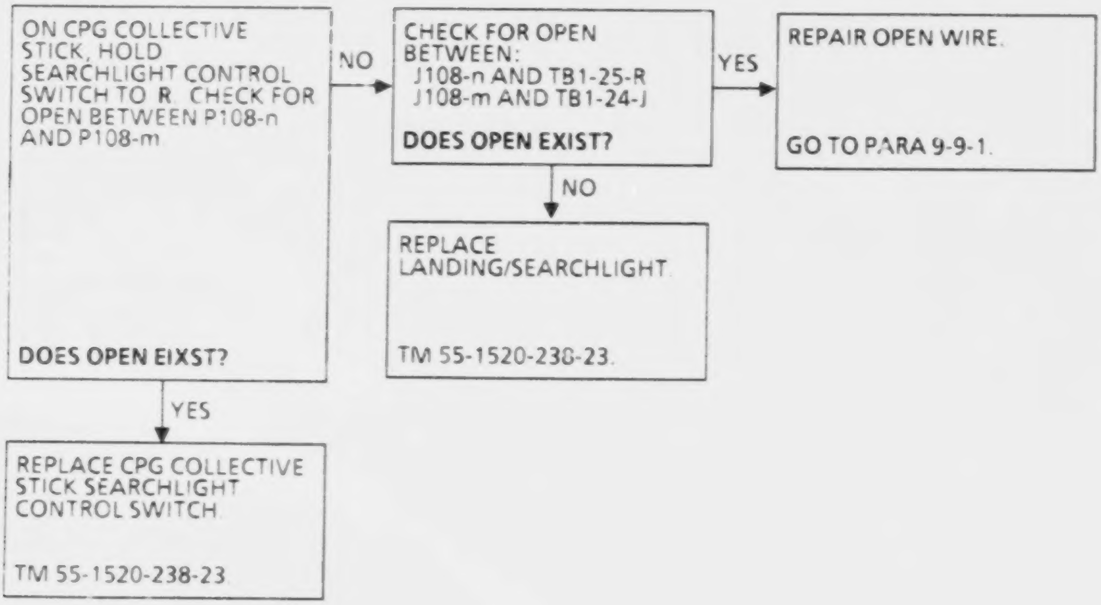
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat removed (cpg)


ON CPG COLLECTIVE STICK, HOLD SEARCHLIGHT CONTROL SWITCH TO R. CHECK FOR OPEN BETWEEN P108-n AND P108-m
DOES OPEN EIXST?
NO
CHECK FOR OPEN BETWEEN:
J108-n AND TB1-25-R
J108-m AND TB1-24-J
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-9-1.
NO
REPLACE LANDING/SEARCHLIGHT.
TM 55-1520-238-23.
YES
REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.
TM 55-1520-238-23

END OF TASK

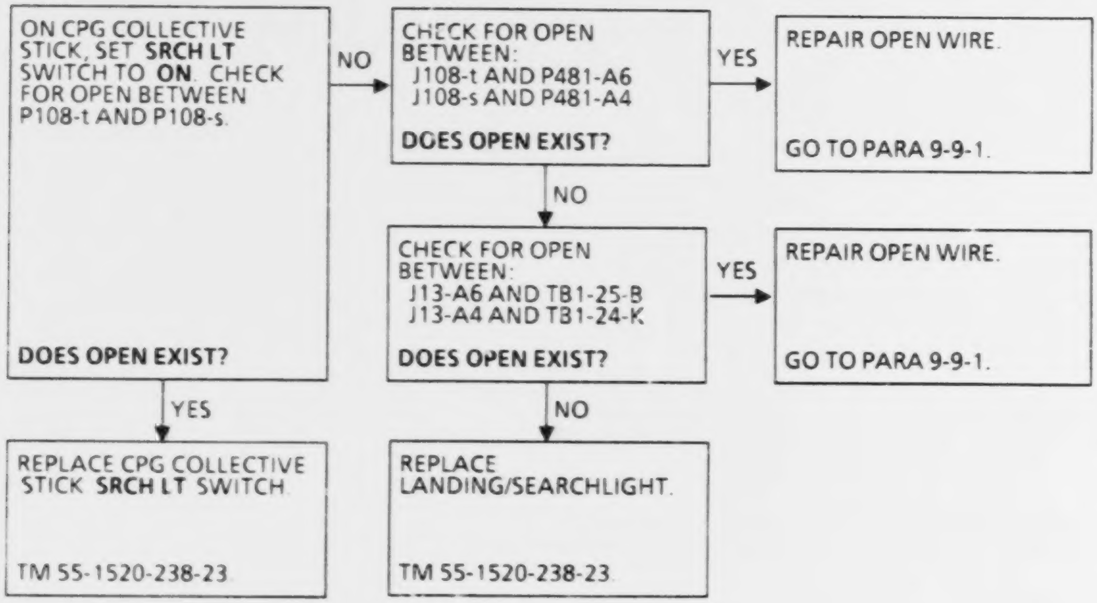
9-9-16. CPG COLLECTIVE STICK - DOES NOT ACTIVATE LANDING/SEARCH LIGHT

Tools: (para 9-9-15)

Personnel Required: (para 9-9-15)

References: (para 9-9-15)

Equipment Conditions: (para 9-9-15)



END OF TASK

9-9-17. CPG COLLECTIVE STICK - DOES NOT RETRACT LANDING/SEARCH LIGHT

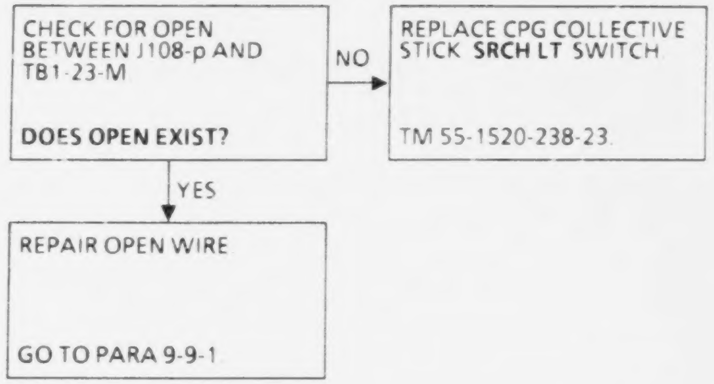
Tools: (para 9-9-15)

Personnel Required: (para 9-9-15)

References: (para 9-9-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Crew station seat (CPG) and nonstransparent barrier removed



CHECK FOR OPEN BETWEEN J108-p AND TB1-23-M

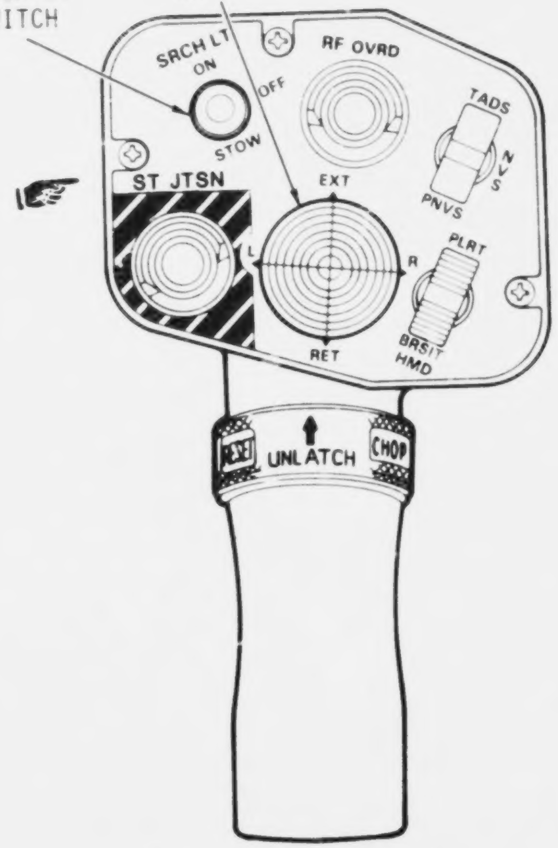
DOES OPEN EXIST?

NO: REPLACE CPG COLLECTIVE STICK **SRCH LT** SWITCH

TM 55-1520-238-23

YES: REPAIR OPEN WIRE

GO TO PARA 9-9-1



PILOT COLLECTIVE STICK

IM04/1-1225B

END OF TASK

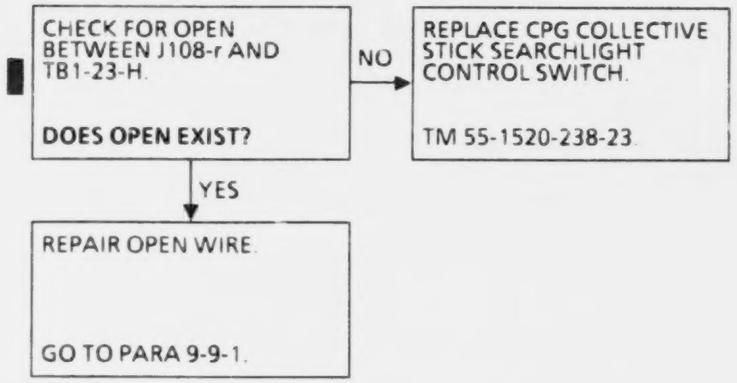
9-9-18. CPG COLLECTIVE STICK - DOES NOT STOW LANDING/SEARCH LIGHT

Tools: (para 9-9-15)

Personnel Required: (para 9-9-15)

References: (para 9-9-15)

Equipment Conditions: (para 9-9-17)



CHECK FOR OPEN BETWEEN J108-r AND TB1-23-H.

DOES OPEN EXIST?

NO: REPLACE CPG COLLECTIVE STICK SEARCHLIGHT CONTROL SWITCH.

TM 55-1520-238-23

YES: REPAIR OPEN WIRE.

GO TO PARA 9-9-1.

END OF TASK

9-9-19. CPG COLLECTIVE STICK EDGE-LIGHT - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

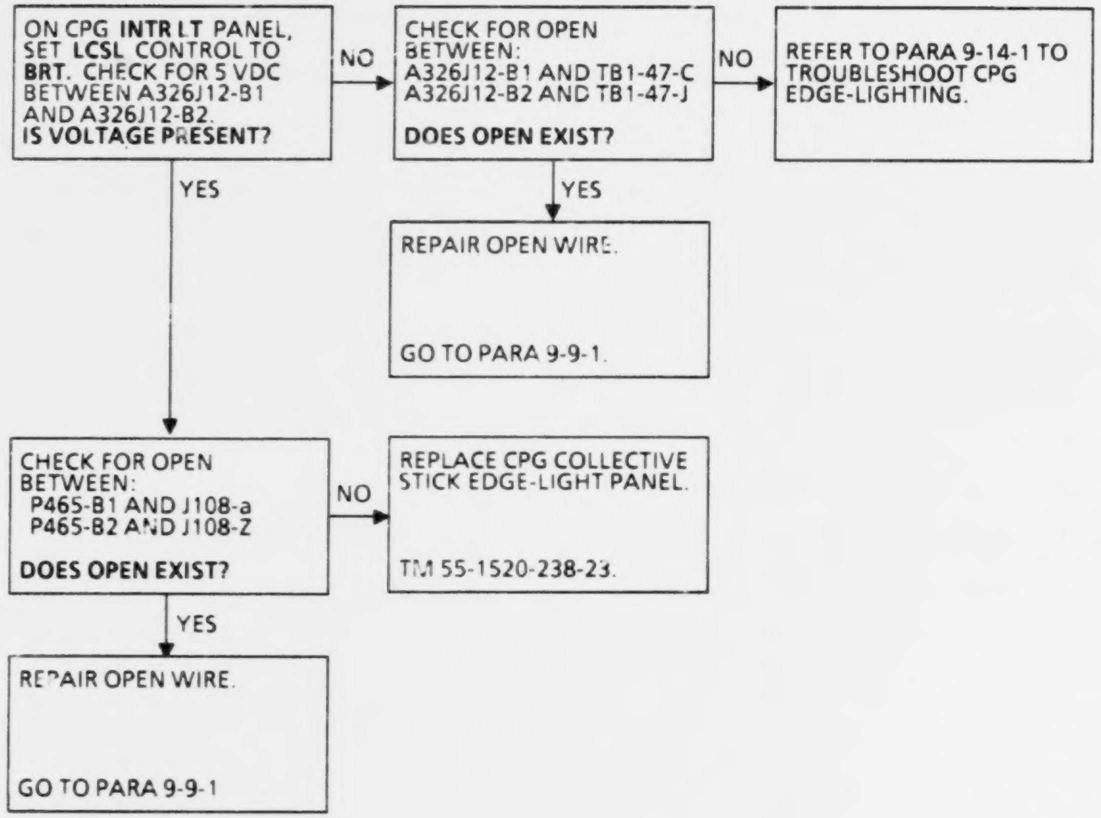
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Nontransparent barrier removed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG **INTR LT** PANEL, SET **LCSL** CONTROL TO **BRT**. CHECK FOR 5 VDC BETWEEN A326J12-B1 AND A326J12-B2. **IS VOLTAGE PRESENT?**
NO
CHECK FOR OPEN BETWEEN: A326J12-B1 AND TB1-47-C A326J12-B2 AND TB1-47-J **DOES OPEN EXIST?**
NO
REFER TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHTING.
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1.
YES
CHECK FOR OPEN BETWEEN: P465-B1 AND J108-a P465-B2 AND J108-Z **DOES OPEN EXIST?**
NO
REPLACE CPG COLLECTIVE STICK EDGE-LIGHT PANEL. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-9-1

END OF TASK

9-10-1. MAINTENANCE LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282
Maintenance Light Assembly	7-116122072

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - B60R and R295 access doors opened

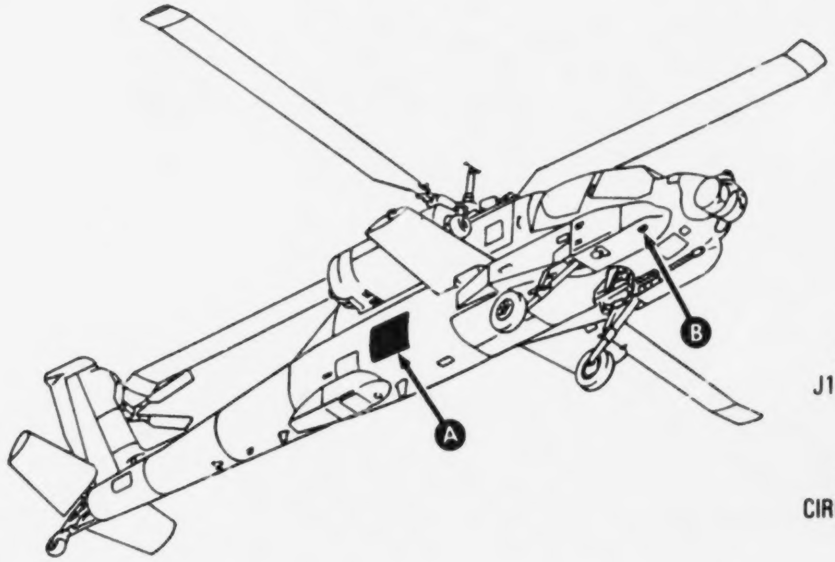
A. Connect battery (TM 55-1520-238-23).

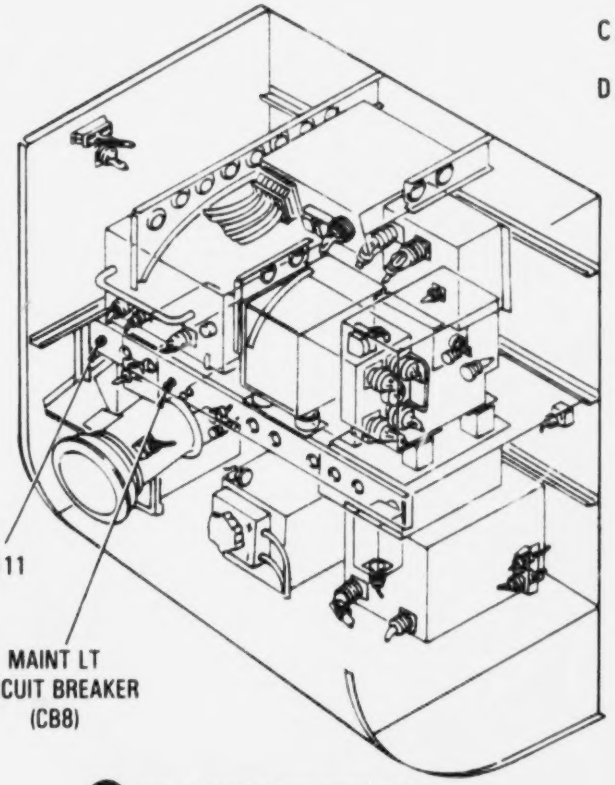
B. Complete operational check as follows:

	TASK	RESULT
1.	In aft avionics bay, check that **MAINT LT** (CB8) circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-10-4.
2.	With maintenance light plugged into J111 in aft avionics bay, turn rheostat to **BRT**. Check that maintenance light is lighted.	If light is not lighted, go to para 9-10-5.
3.	With maintenance light plugged into J112 in **RIGHT FAB**, turn rheostat to **BRT**. Check that maintenance light is lighted.	If light is not lighted, go to para 9-10-6.

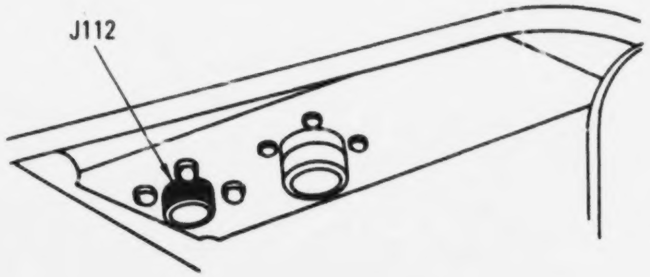
C. Disconnect battery (TM 55-1520-238-23).

D. Secure access doors B60R and R295 (TM 55-1520-238-23).

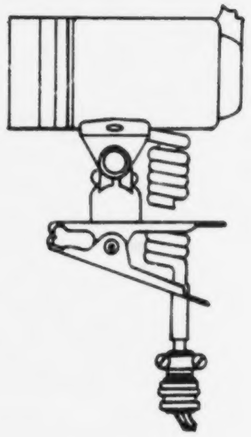




Ⓐ AFT AVIONICS BAY THRU R295



Ⓑ MAINTENANCE LIGHT JACK

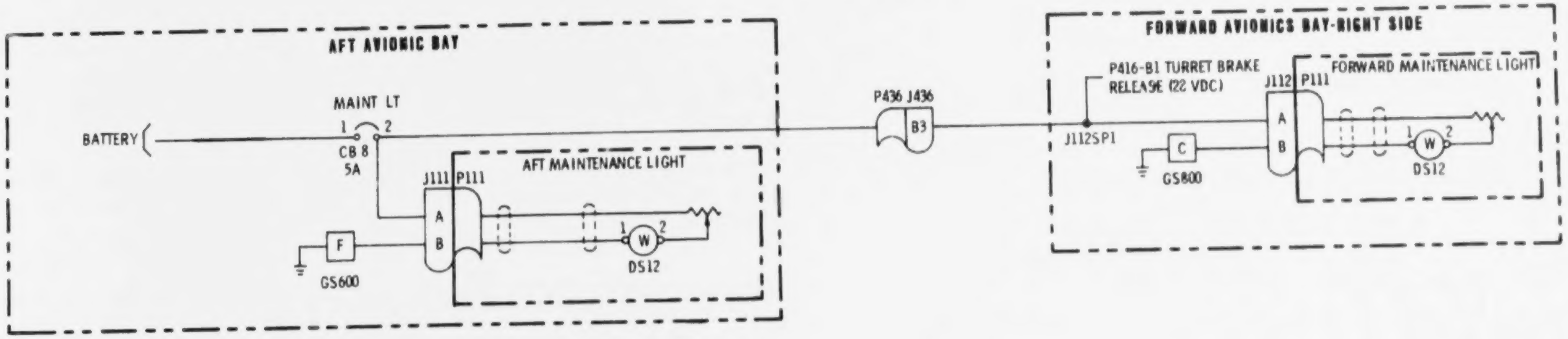


MAINTENANCE LIGHT

MM04/1-1024A

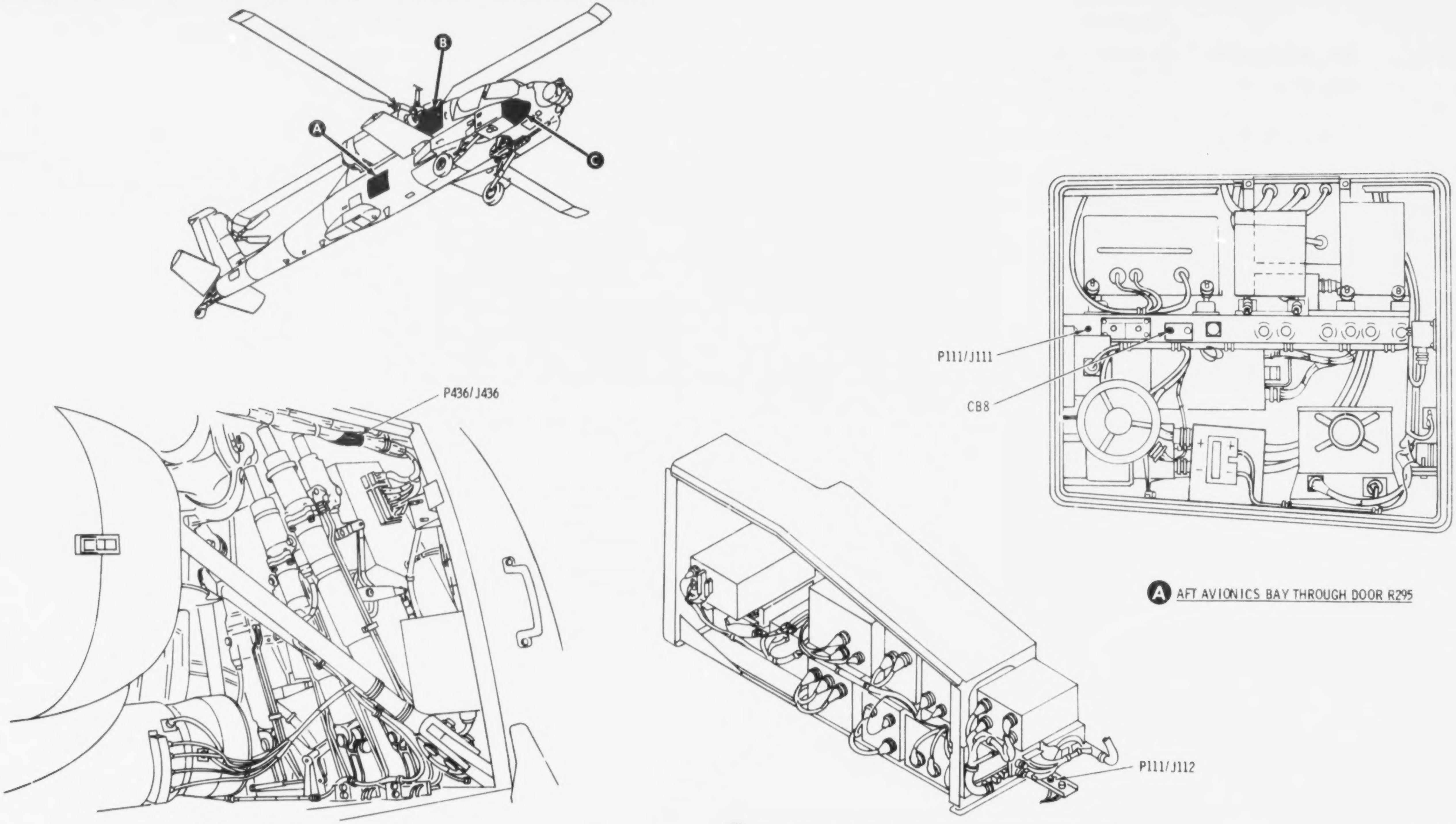
END OF TASK

9-10-2. MAINTENANCE LIGHTS - INTERCONNECTION DIAGRAM



MM01/1-730A

9-10-3. MAINTENANCE LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURAITON



Ⓐ AFT AVIONICS BAY THROUGH DOOR R295

Ⓑ MAIN DECK THROUGH PANEL R200

Ⓒ RIGHT HAND FORWARD AVIONICS BAY THROUGH FAIRING R60

MM04/1-1226B

9-10-4. MAINT LT CIRCUIT BREAKER (CB8) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

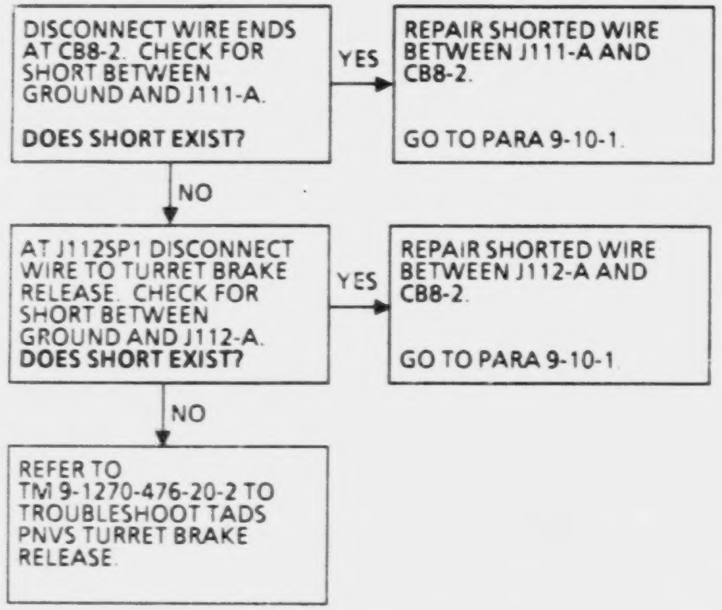
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23
TM 9-1270-476-20

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R295 door opened



DISCONNECT WIRE ENDS AT CB8-2. CHECK FOR SHORT BETWEEN GROUND AND J111-A.
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN J111-A AND CB8-2.
GO TO PARA 9-10-1.

NO: AT J112SP1 DISCONNECT WIRE TO TURRET BRAKE RELEASE. CHECK FOR SHORT BETWEEN GROUND AND J112-A.
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN J112-A AND CB8-2.
GO TO PARA 9-10-1.

NO: REFER TO TM 9-1270-476-20-2 TO TROUBLESHOOT TADS PNVS TURRET BRAKE RELEASE.

END OF TASK

9-10 MAINTENANCE LIGHT - DOES NOT OPERATE IN AFT AVIONICS BAY

9-10-4/9-10-5

Tools: (para 9-10-4)

Personnel Required: (para 9-10-4)

References:

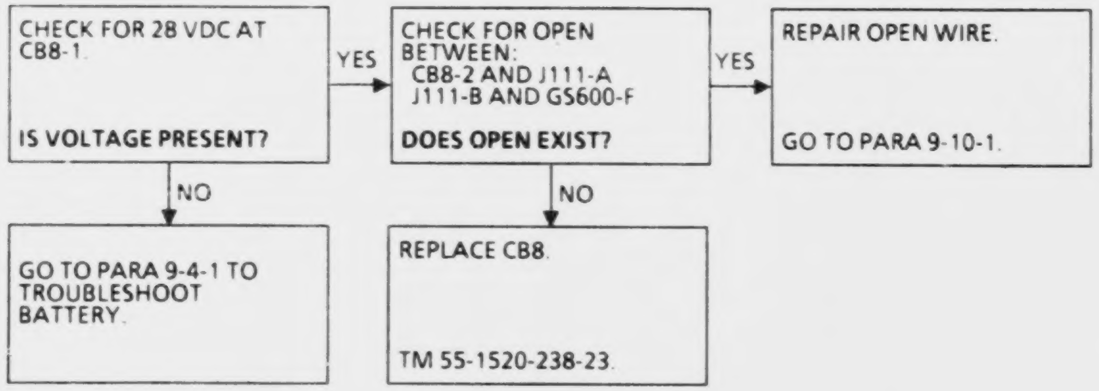
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Battery connected
	Access provisions - R295 door opened

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 28 VDC AT CB8-1.
IS VOLTAGE PRESENT?

NO: GO TO PARA 9-4-1 TO TROUBLESHOOT BATTERY.

YES: CHECK FOR OPEN BETWEEN:
CB8-2 AND J111-A
J111-B AND GS600-F
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE.
GO TO PARA 9-10-1.

NO: REPLACE CB8.
TM 55-1520-238-23.

END OF TASK

9-10-6. MAINTENANCE LIGHT - DOES NOT OPERATE IN RIGHT FORWARD AVIONICS BAY

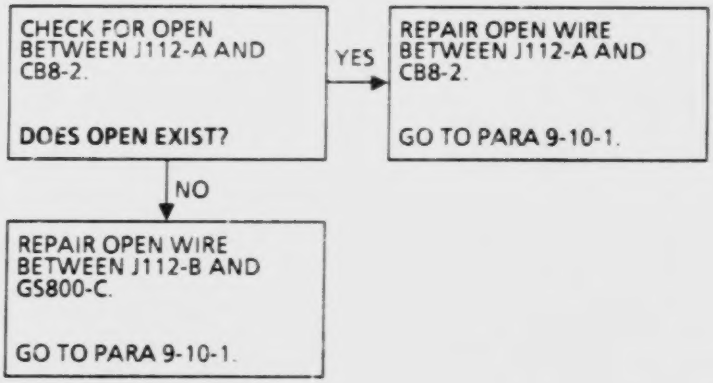
Tools: (para 9-10-4)

Personnel Required: (para 9-10-4)

References: (para 9-10-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Accessing provisions - R295 and R90 doors opened


CHECK FOR OPEN BETWEEN J112-A AND CB8-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN J112-A AND CB8-2.
GO TO PARA 9-10-1.
NO
REPAIR OPEN WIRE BETWEEN J112-B AND GS800-C.
GO TO PARA 9-10-1.

END OF TASK

9-11-1. PILOT UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Ground Power Unit, Aviation (AGPU)	1730-01-144-1897

Personnel Required:

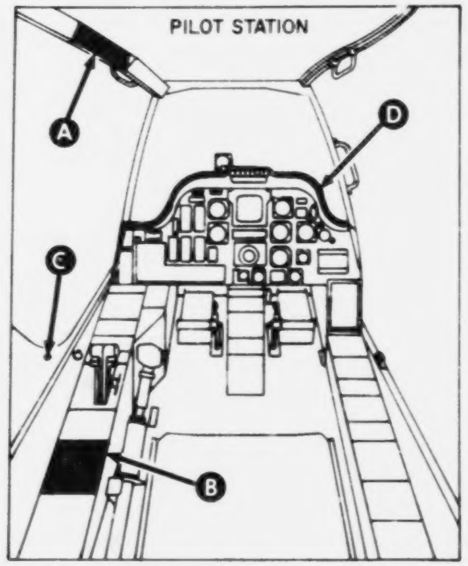
68F10 Aircraft Electrician

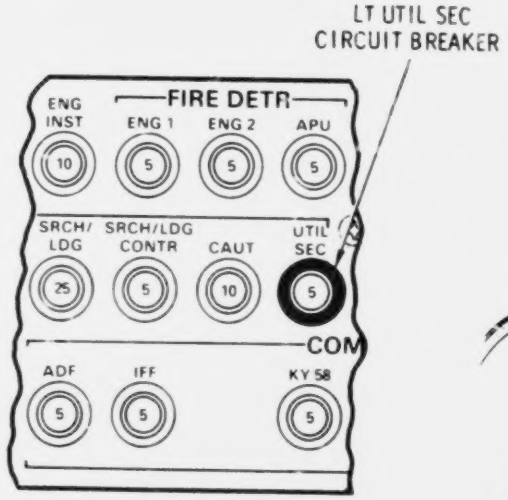
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

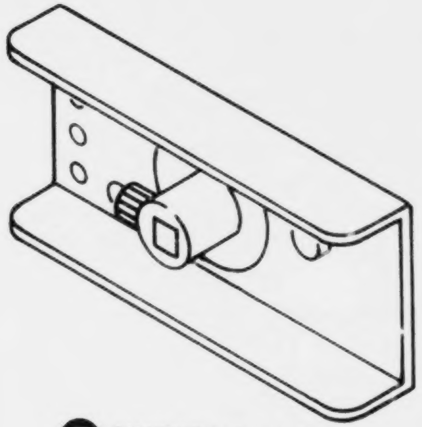




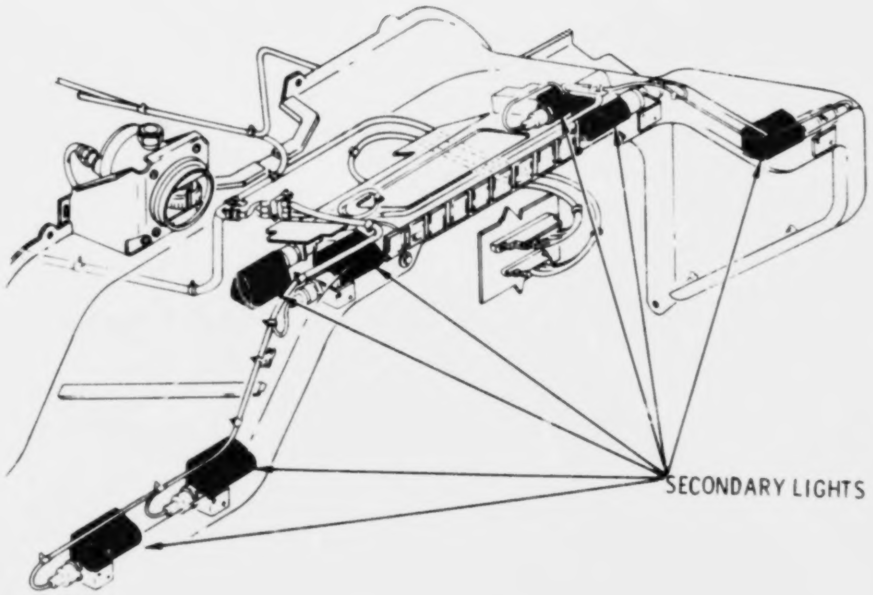
Ⓐ PILOT CENTER CIRCUIT BREAKER PANEL

WARNING

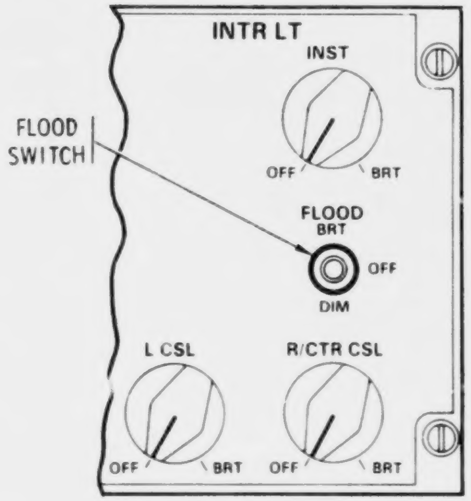
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



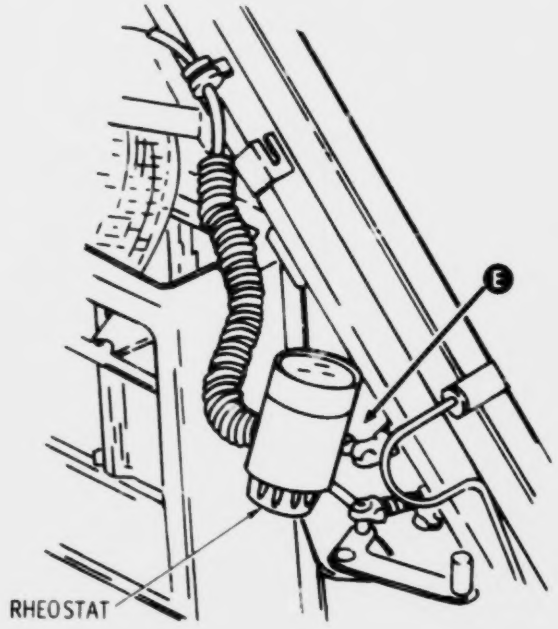
Ⓔ PILOT UTILITY LIGHT MOUNTING BRACKET



Ⓓ PILOT GLARESHIELD



Ⓑ PILOT EXT LT/INTR PANEL



Ⓒ PILOT UTILITY LIGHT

MM04/1-1025D

GO TO NEXT PAGE

9-11-1. PILOT UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK (cont)

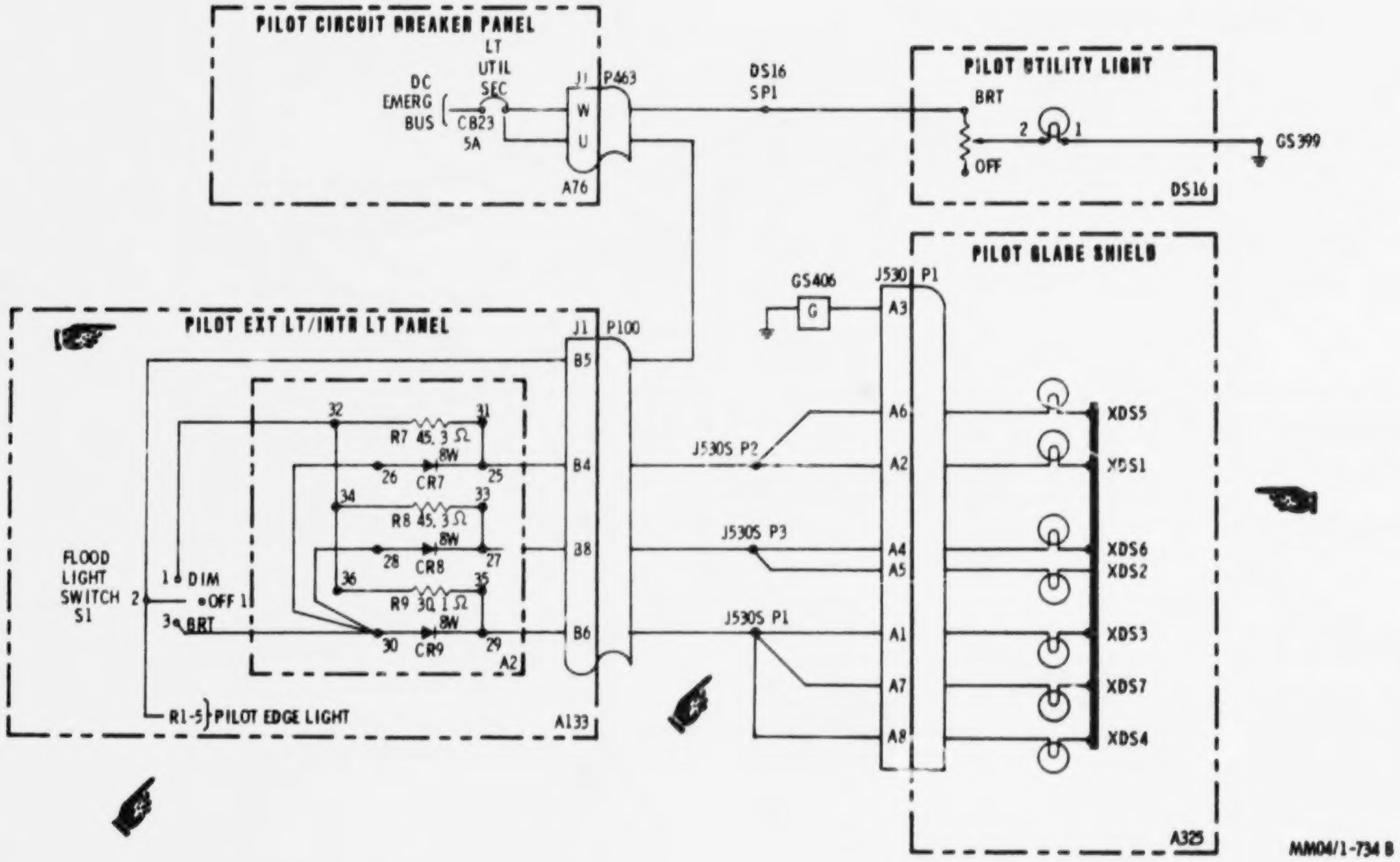
A. Perform operational check as follows:

TASK	RESULT
1. Check for continuity between ground and J530-A3.	If continuity does not exist, repair open wire between J530-A3 and GS406-G.
2. On pilot center circuit breaker panel, check that LT UTIL SEC circuit breaker closed.	If circuit breaker does not stay closed, go to para 9-11-4.
3. Perform External Power Application - Electrical (TM 55-1520-238-23).	
4. On pilot **EXT LT/INTR LT** panel, set **FLOOD** switch (S1) to **DIM**, and then to **BRT**. Check that all glareshield secondary lights are lighted in both positions.	If all secondary lights light in one position and not the other, replace pilot **EXT LT/INTR LT** panel (TM 55-1520-238-23). If **LT UTIL SEC** circuit breaker does not stay closed, go to para 9-11-4. If one or more lights are not lighted in both positions, go to para 9-11-5.
5. Remove pilot utility light from mounting bracket.	
6. While holding pilot utility light, set rheostat to **BRT**. Utility light is lighted.	If utility light is not lighted, go to para 9-11-6.
7. Reinstall pilot utility light onto mounting bracket.	
8. On pilot **EXT LT/INTR LT** panel, set **FLOOD** switch to **OFF**.	
9. On pilot utility light, turn rheostat to OFF.	

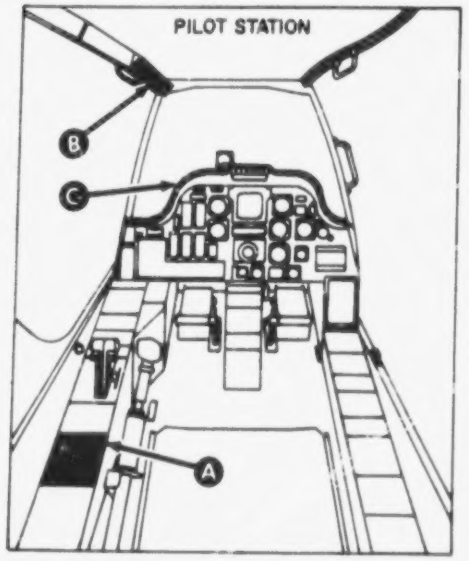
B. Remove external power - Electrical (TM 55-1520-238-23).

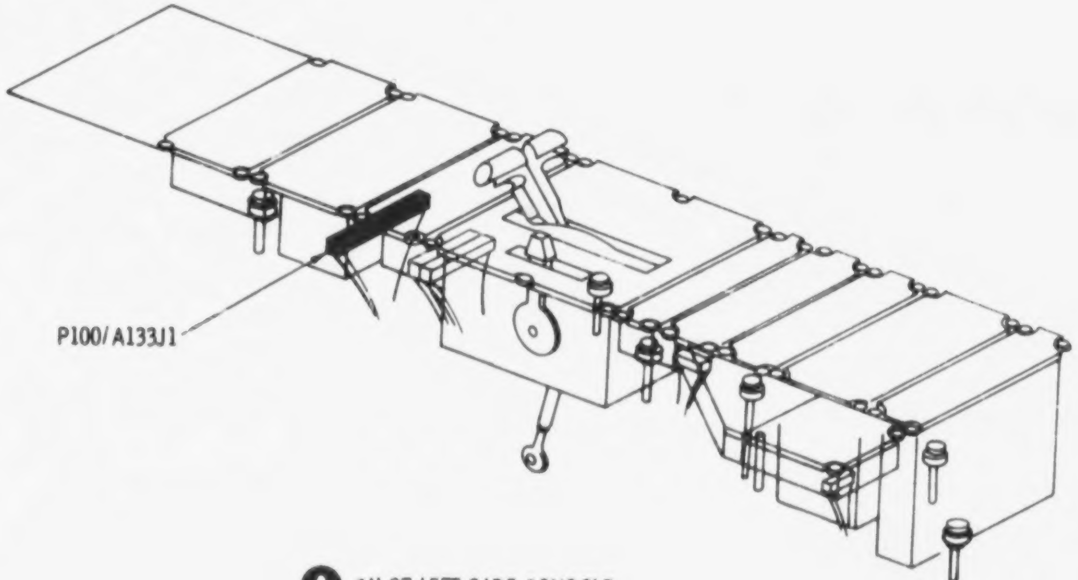
END OF TASK

9-11-2. PILOT UTILITY AND SECONDARY LIGHTS - INTERCONNECTION DIAGRAM

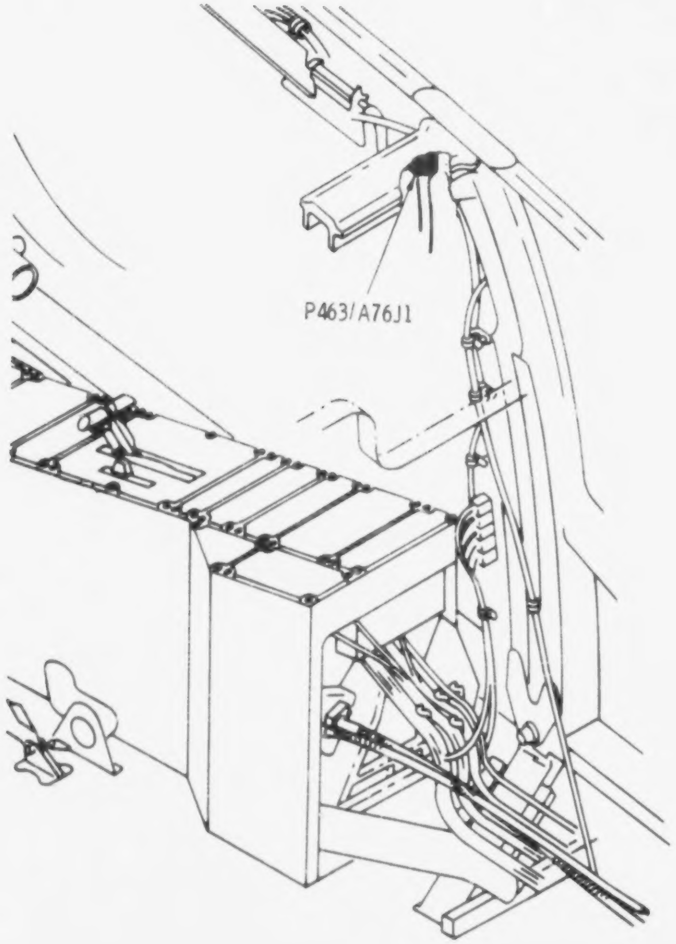


9-11-3. PILOT UTILITY AND SECONDARY LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

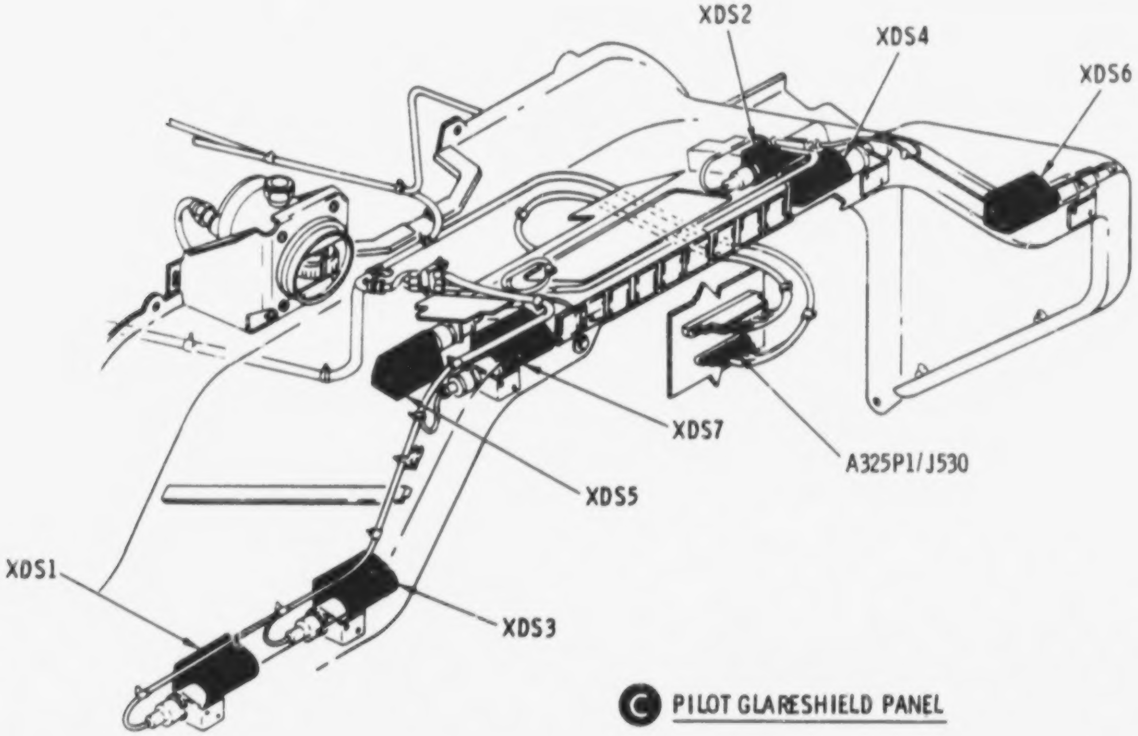




A PILOT LEFT SIDE CONSOLE



B PILOT STATION LEFT SIDE



C PILOT GLARESHIELD PANEL

MM04/1-1227C

9-11-4. LT UTIL SEC CIRCUIT BREAKER (CB23) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

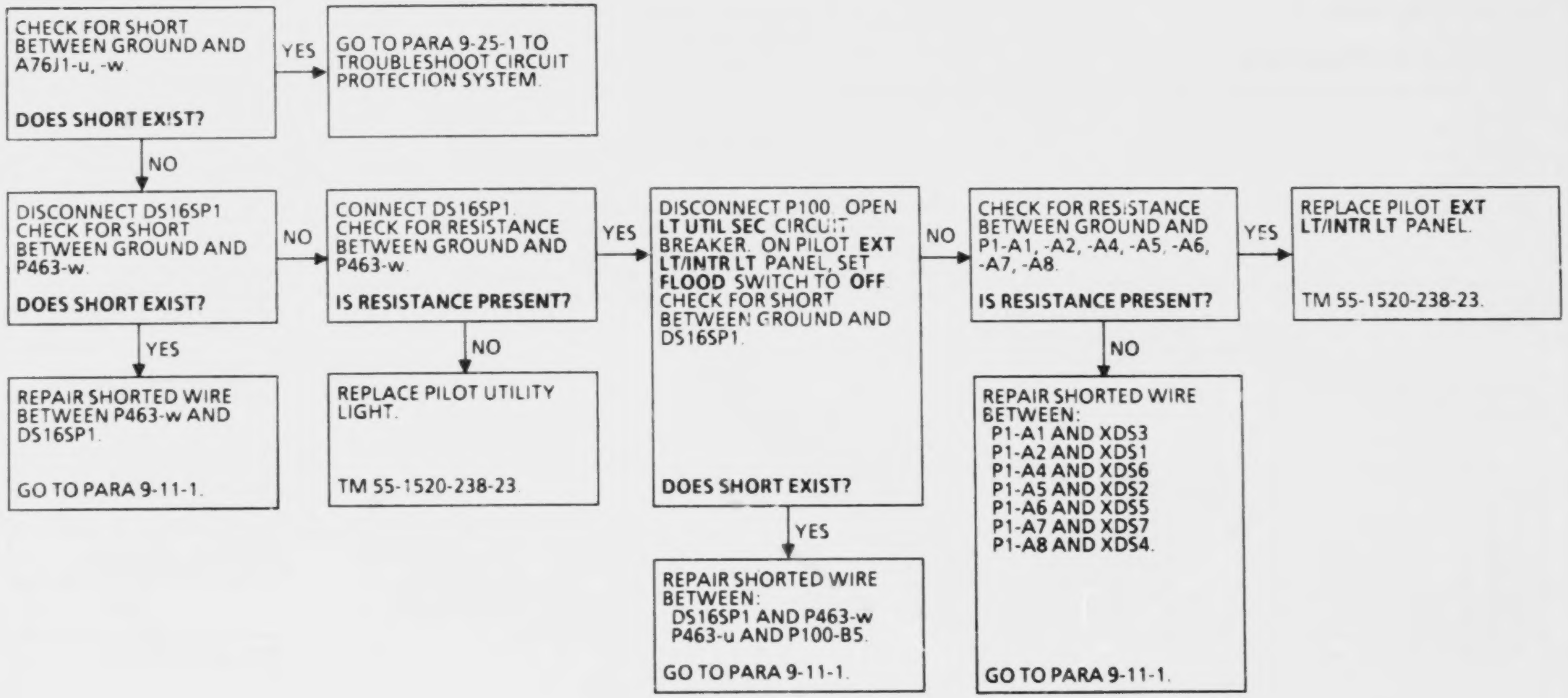
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR SHORT BETWEEN GROUND AND A76J1-u, -w. DOES SHORT EXIST?
YES
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT DS16SP1. CHECK FOR SHORT BETWEEN GROUND AND P463-w. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN P463-w AND DS16SP1. GO TO PARA 9-11-1.
NO
CONNECT DS16SP1. CHECK FOR RESISTANCE BETWEEN GROUND AND P463-w. IS RESISTANCE PRESENT?
NO
REPLACE PILOT UTILITY LIGHT. TM 55-1520-238-23.
YES
DISCONNECT P100. OPEN LT UTIL SEC CIRCUIT BREAKER. ON PILOT EXT LT/INTR LT PANEL, SET FLOOD SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND DS16SP1. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: DS16SP1 AND P463-w P463-u AND P100-B5. GO TO PARA 9-11-1.
NO
CHECK FOR RESISTANCE BETWEEN GROUND AND P1-A1, -A2, -A4, -A5, -A6, -A7, -A8. IS RESISTANCE PRESENT?
YES
REPLACE PILOT EXT LT/INTR LT PANEL. TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN: P1-A1 AND XDS3 P1-A2 AND XDS1 P1-A4 AND XDS6 P1-A5 AND XDS2 P1-A6 AND XDS5 P1-A7 AND XDS7 P1-A8 AND XDS4. GO TO PARA 9-11-1.

END OF TASK

9-11-5. ONE OR MORE PILOT SECONDARY LIGHTS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

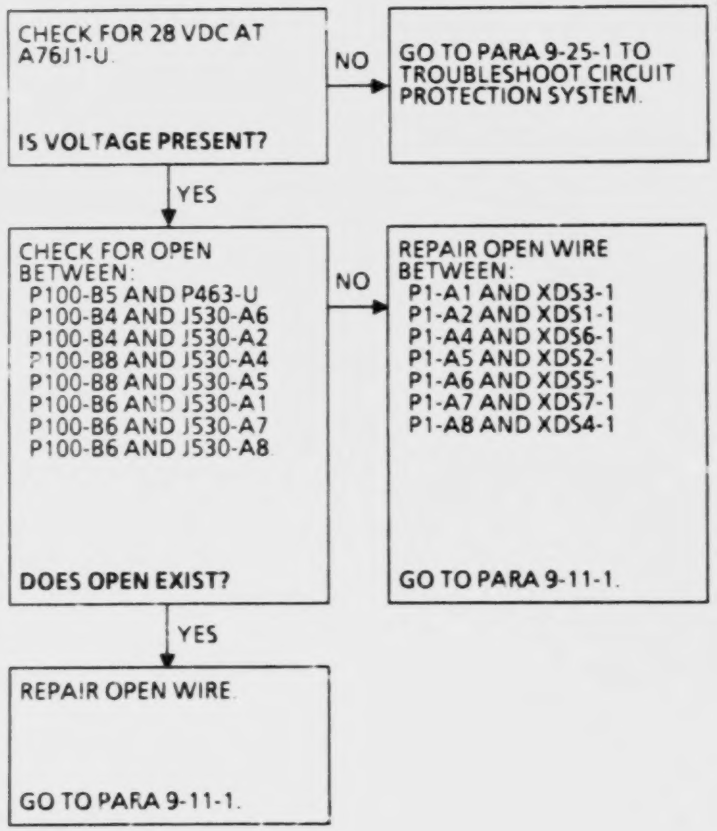
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-11-6. PILOT UTILITY LIGHT - DOES NOT LIGHT

Tools: (para 9-11-5)

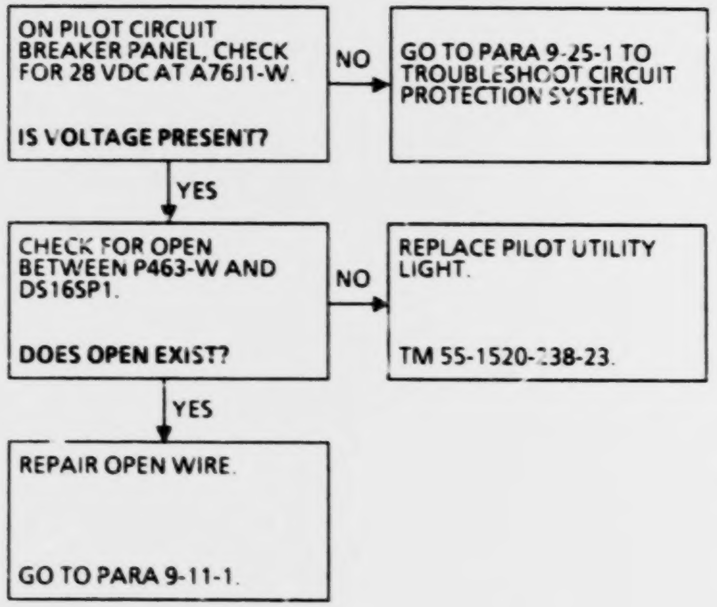
Personnel Required: (para 9-11-5)

References: (para 9-11-5)

Equipment Conditions: (para 9-11-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A76J1-W.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN P463-W AND DS16SP1.
DOES OPEN EXIST?
NO
REPLACE PILOT UTILITY LIGHT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-11-1.

END OF TASK

9-12-1. CPG UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Ground Power Unit, Aviation (AGPU)	1730-01-144-1897

Personnel Required:

68F10 Aircraft Electrician

References:

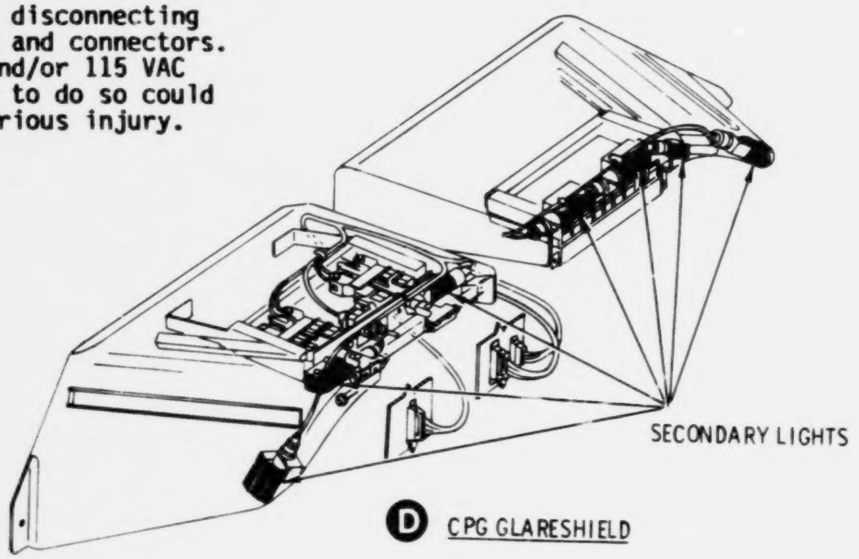
TM 55-1520-238-23

Equipment Conditions:

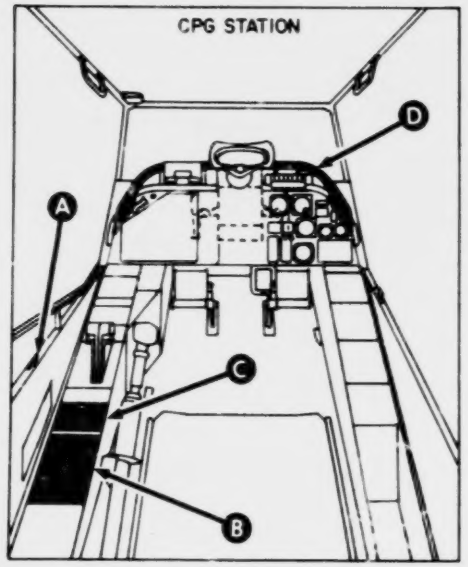
Ref	Condition
TM 55-1520-238-23	Helicopter safed

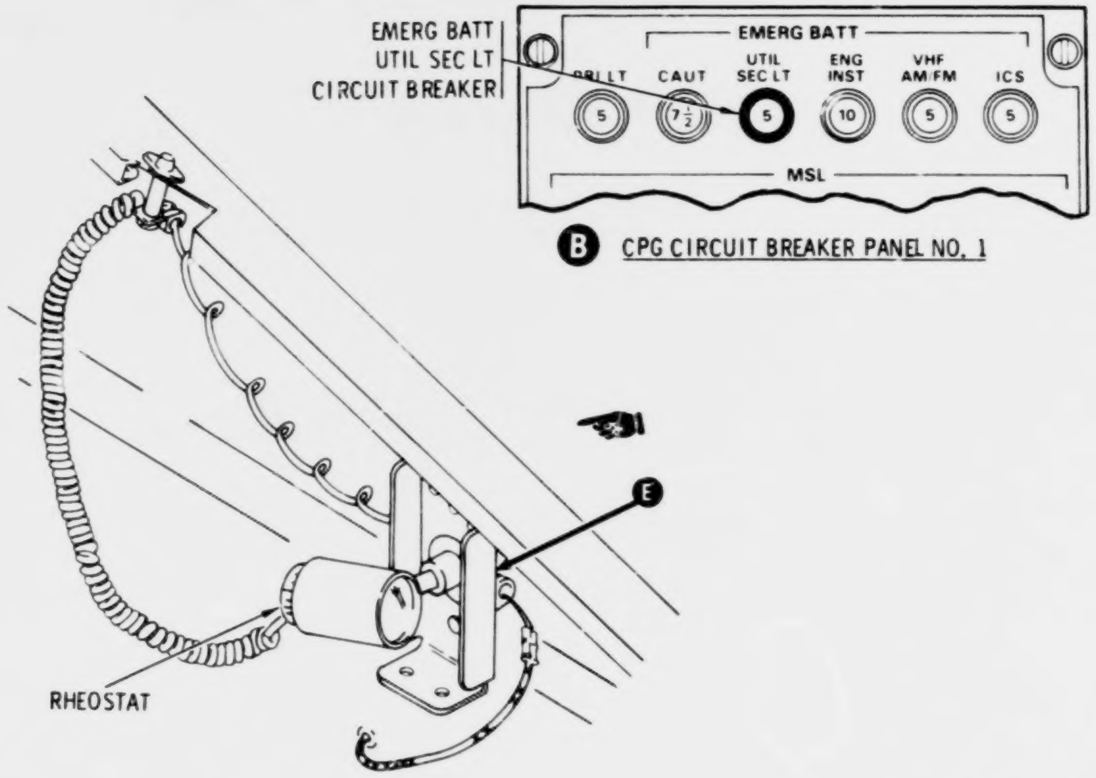
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



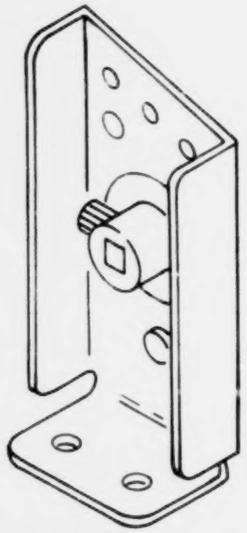
D CPG GLARESHIELD



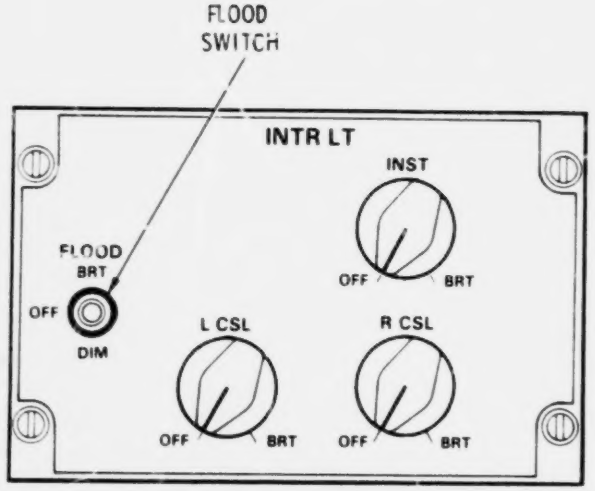


B CPG CIRCUIT BREAKER PANEL NO. 1

A CPG UTILITY LIGHT



E CPG UTILITY LIGHT MOUNTING BRACKET



C CPG INTR LT PANEL

MM04/1-1026D

GO TO NEXT PAGE

9-12-1. CPG UTILITY AND SECONDARY LIGHTS - OPERATIONAL CHECK (cont)

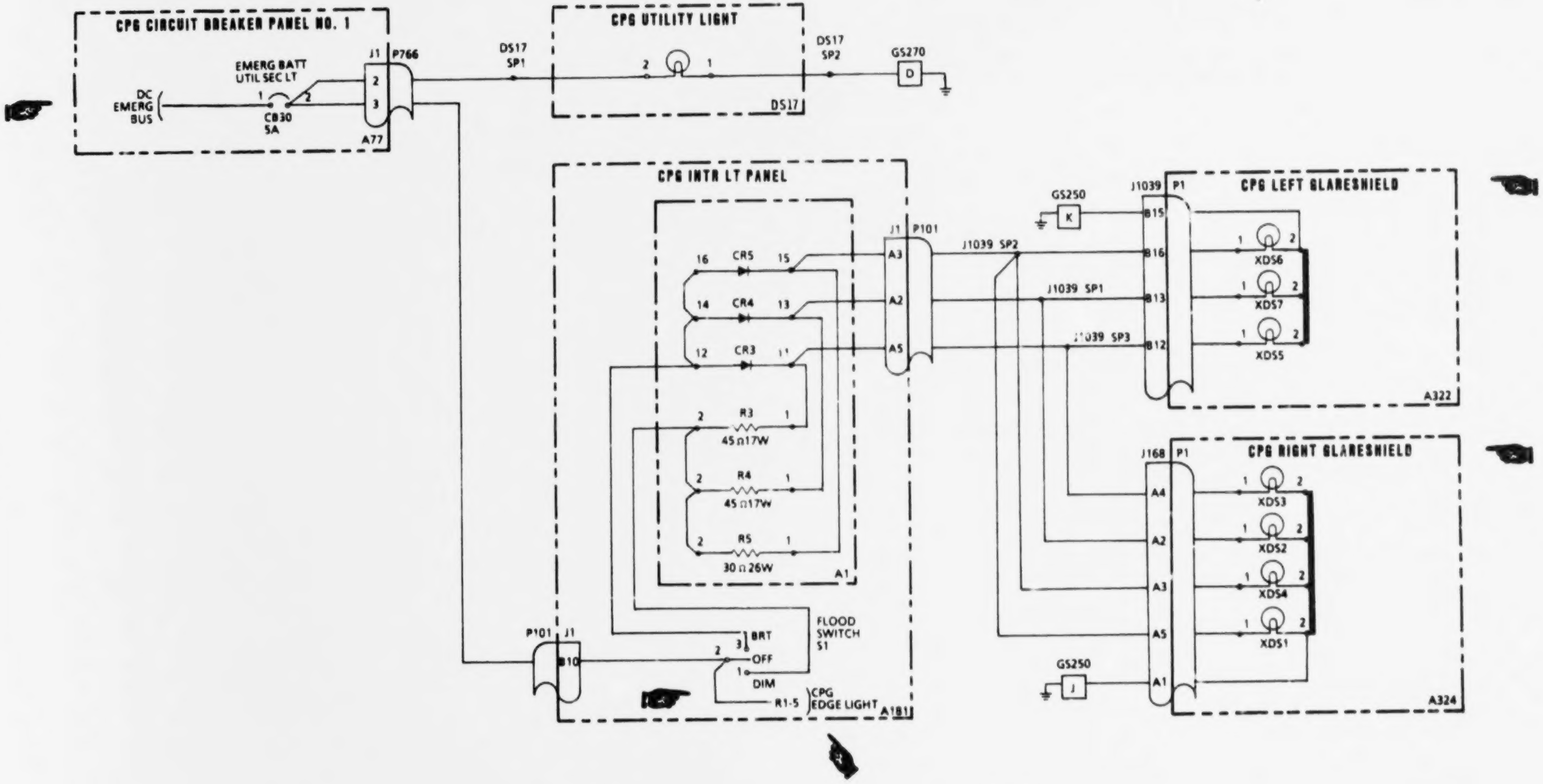
A. Perform operational check as follows:

TASK	RESULT
1. Check for continuity between ground and J168-A1.	If continuity does not exist, repair open wire between J168-A1 and GS250-J.
2. Check for continuity between ground and J1039-B15.	If continuity does not exist, repair open wire between J1039-B15 and GS250-K.
3. Perform External Power Application - Electrical (TM 55-1520-238-23).	
4. On CPG circuit breaker panel, check that **EMERG BATT UTIL SEC LT** circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-12-4.
5. On CPG **INTR LT** panel, set **FLOOD** switch to **DIM**, and then to **BRT**. Check that all glareshield secondary lights are lighted in both switch positions.	If **EMERG BATT UTIL SEC LT** circuit breaker does not stay closed, go to para 9-12-4. If all lights light in one position and not the other, replace CPG **INTR LT** panel (TM 55-1520-238-23). If one or more lights are not lighted in both switch positions, go to para 9-12-5.
6. Remove CPG utility light from mounting bracket.	
7. While holding CPG utility light, turn rheostat to **BRT**. Check that utility light is lighted.	If utility light is not lighted, go to para 9-12-6.
8. Reinstall CPG utility light onto mounting bracket.	
9. On CPG **INTR LT** panel, set **FLOOD** switch to **OFF**.	
10. On CPG utility light, turn rheostat to **OFF**.	

B. Remove external power - Electrical (TM 55-1520-238-23).

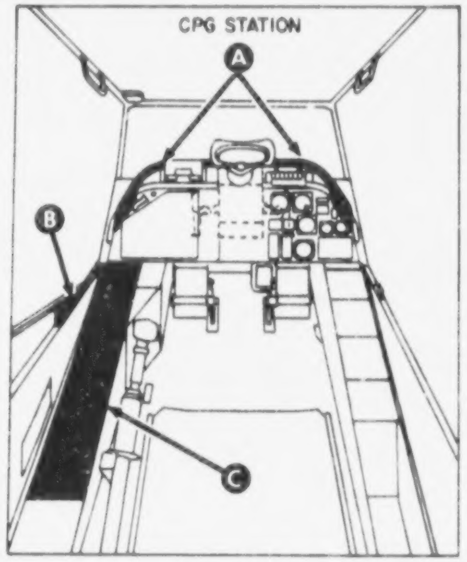
END OF TASK

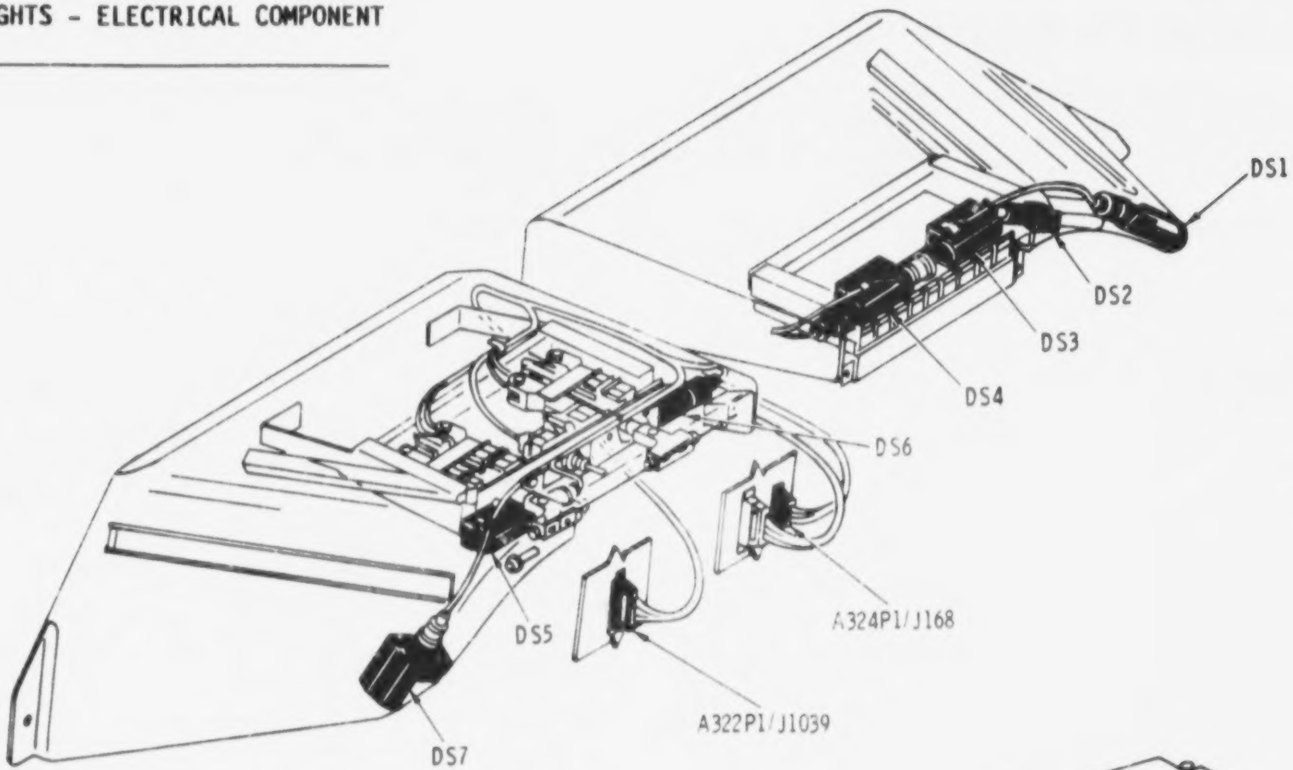
9-12-2. CPG UTILITY AND SECONDARY LIGHTS - INTERCONNECTION DIAGRAM



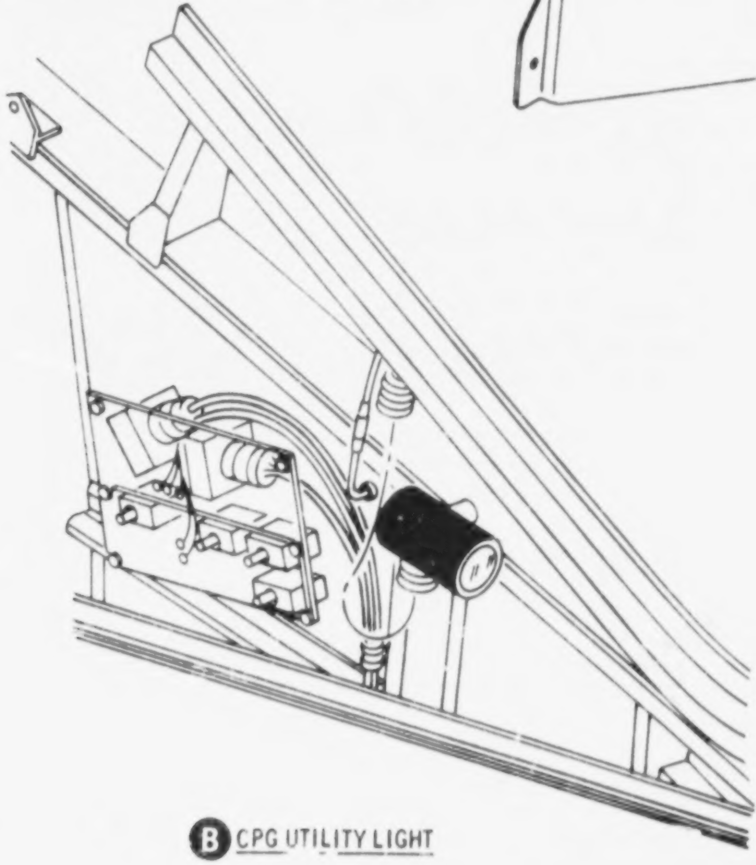
MM04/1-742D

9-12-3. CPG UTILITY AND SECONDARY LIGHTS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

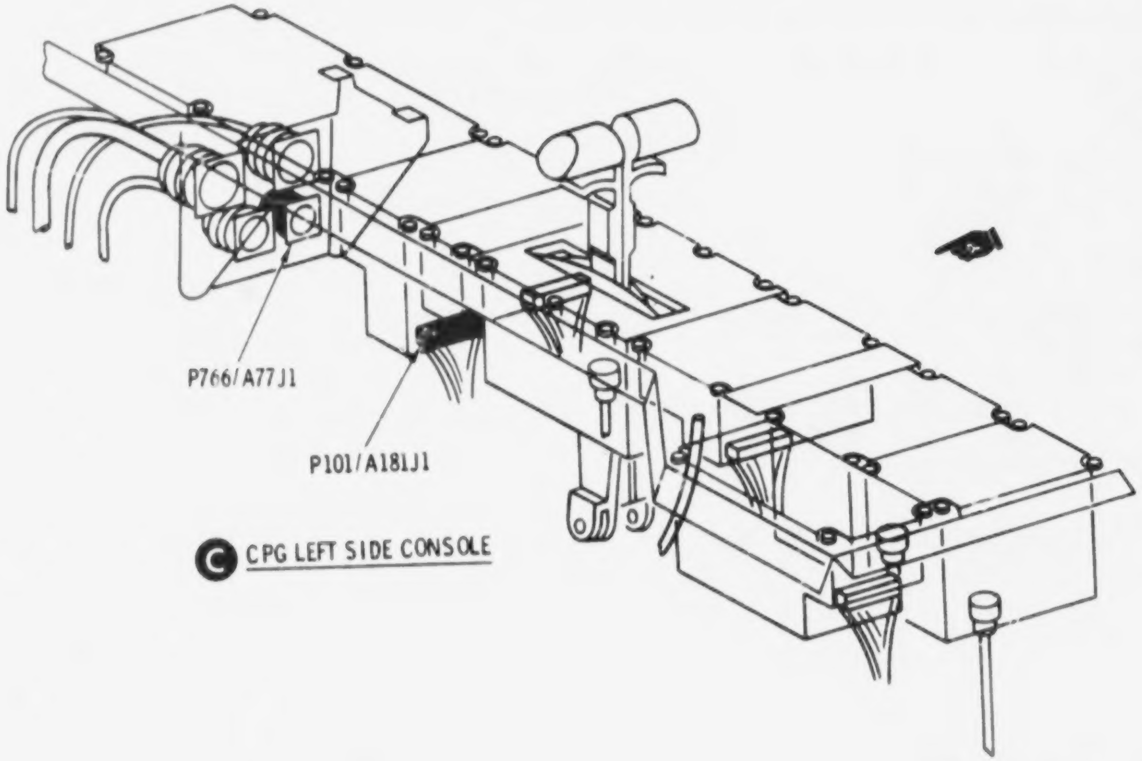




A CPG GLARESHIELD PANEL



B CPG UTILITY LIGHT



C CPG LEFT SIDE CONSOLE

MM04/1-1229C

9-12-4. EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30) - DOES NOT STAY CLOSED

9-12-4

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

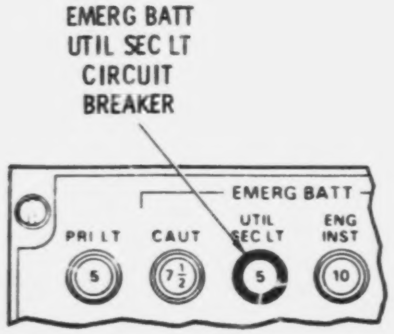
68F10 Aircraft Electrician

References:

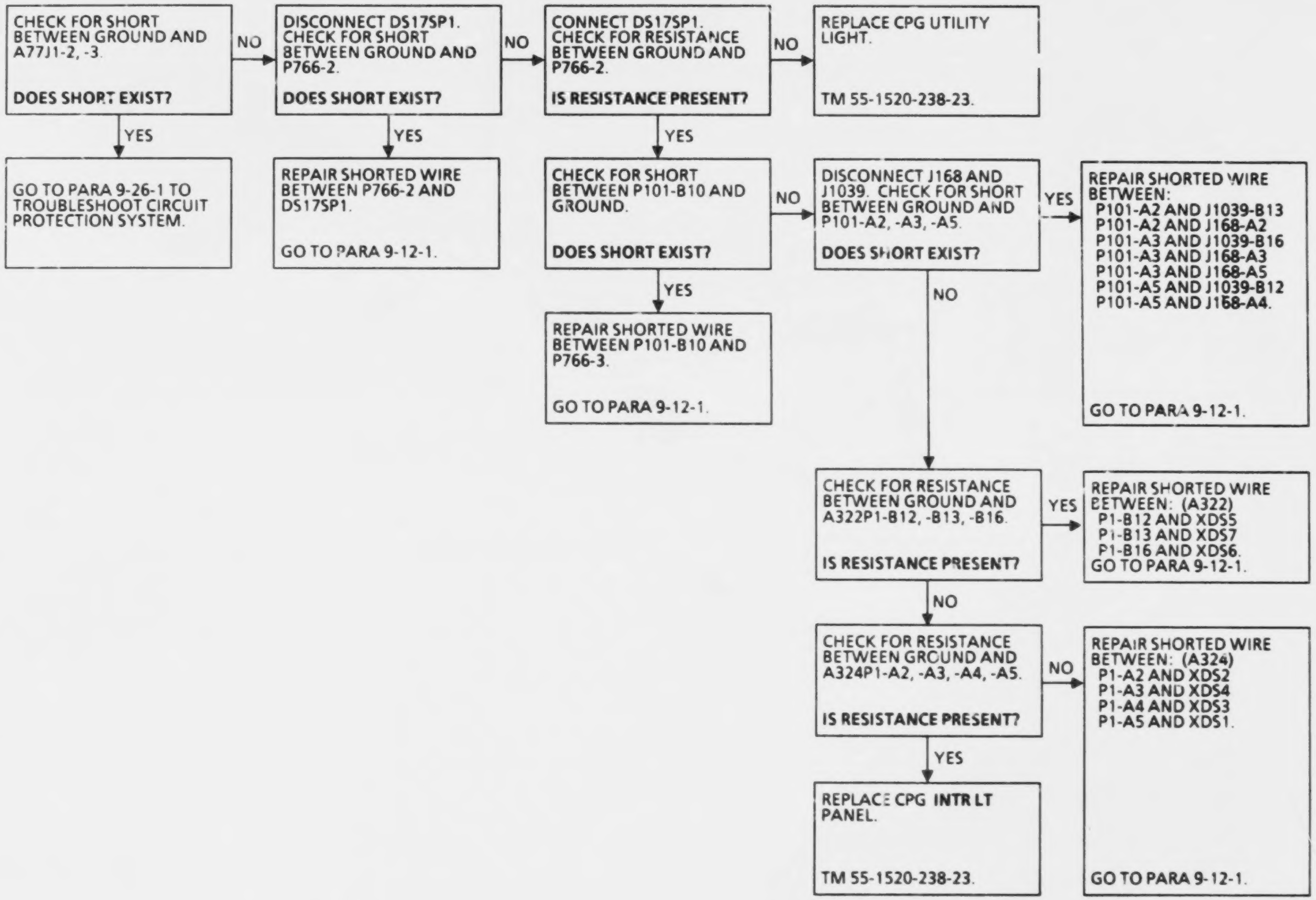
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



CPG CIRCUIT BREAKER PANEL NO. 1


CHECK FOR SHORT BETWEEN GROUND AND A77J1-2, -3. DOES SHORT EXIST?
NO
DISCONNECT DS17SP1. CHECK FOR SHORT BETWEEN GROUND AND P766-2. DOES SHORT EXIST?
NO
CONNECT DS17SP1. CHECK FOR RESISTANCE BETWEEN GROUND AND P766-2. IS RESISTANCE PRESENT?
NO
REPLACE CPG UTILITY LIGHT. TM 55-1520-238-23.
YES
GO TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
REPAIR SHORTED WIRE BETWEEN P766-2 AND DS17SP1. GO TO PARA 9-12-1.
YES
CHECK FOR SHORT BETWEEN P101-B10 AND GROUND. DOES SHORT EXIST?
NO
DISCONNECT J168 AND J1039. CHECK FOR SHORT BETWEEN GROUND AND P101-A2, -A3, -A5. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P101-A2 AND J1039-B13 P101-A2 AND J168-A2 P101-A3 AND J1039-B16 P101-A3 AND J168-A3 P101-A3 AND J168-A5 P101-A5 AND J1039-B12 P101-A5 AND J168-A4. GO TO PARA 9-12-1.
YES
REPAIR SHORTED WIRE BETWEEN P101-B10 AND P766-3. GO TO PARA 9-12-1.
NO
CHECK FOR RESISTANCE BETWEEN GROUND AND A322P1-B12, -B13, -B16. IS RESISTANCE PRESENT?
YES
REPAIR SHORTED WIRE BETWEEN: (A322) P1-B12 AND XDS5 P1-B13 AND XDS7 P1-B16 AND XDS6. GO TO PARA 9-12-1.
NO
CHECK FOR RESISTANCE BETWEEN GROUND AND A324P1-A2, -A3, -A4, -A5. IS RESISTANCE PRESENT?
NO
REPAIR SHORTED WIRE BETWEEN: (A324) P1-A2 AND XDS2 P1-A3 AND XDS4 P1-A4 AND XDS3 P1-A5 AND XDS1. GO TO PARA 9-12-1.
YES
REPLACE CPG INTR LT PANEL. TM 55-1520-238-23.

MM04/1-1230

END OF TASK

9-12-5. ONE OR MORE CPG SECONDARY LIGHTS - DO NOT LIGHT

Tools: (para 9-12-4)

Personnel Required: (para 9-12-4)

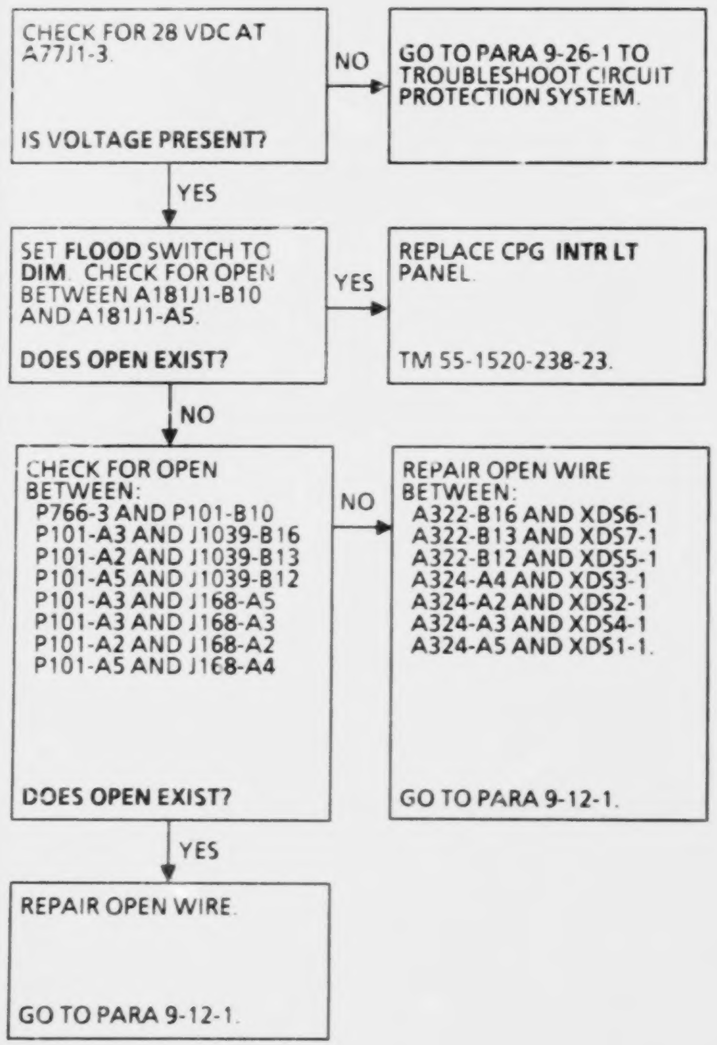
References: (para 9-12-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 28 VDC AT A77J1-3. IS VOLTAGE PRESENT?

NO: GO TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

YES: SET **FLOOD** SWITCH TO DIM. CHECK FOR OPEN BETWEEN A181J1-B10 AND A181J1-A5. **DOES OPEN EXIST?**

YES: REPLACE CPG **INTR LT** PANEL. TM 55-1520-238-23.

NO: CHECK FOR OPEN BETWEEN:
P766-3 AND P101-B10
P101-A3 AND J1039-B16
P101-A2 AND J1039-B13
P101-A5 AND J1039-B12
P101-A3 AND J168-A5
P101-A3 AND J168-A3
P101-A2 AND J168-A2
P101-A5 AND J168-A4
DOES OPEN EXIST?

NO: REPAIR OPEN WIRE BETWEEN:
A322-B16 AND XDS6-1
A322-B13 AND XDS7-1
A322-B12 AND XDS5-1
A324-A4 AND XDS3-1
A324-A2 AND XDS2-1
A324-A3 AND XDS4-1
A324-A5 AND XDS1-1.
GO TO PARA 9-12-1.

YES: REPAIR OPEN WIRE. GO TO PARA 9-12-1.

END OF TASK

9-12-6. CPG UTILITY LIGHT DOES NOT LIGHT

Tools: (para 9-12-4)

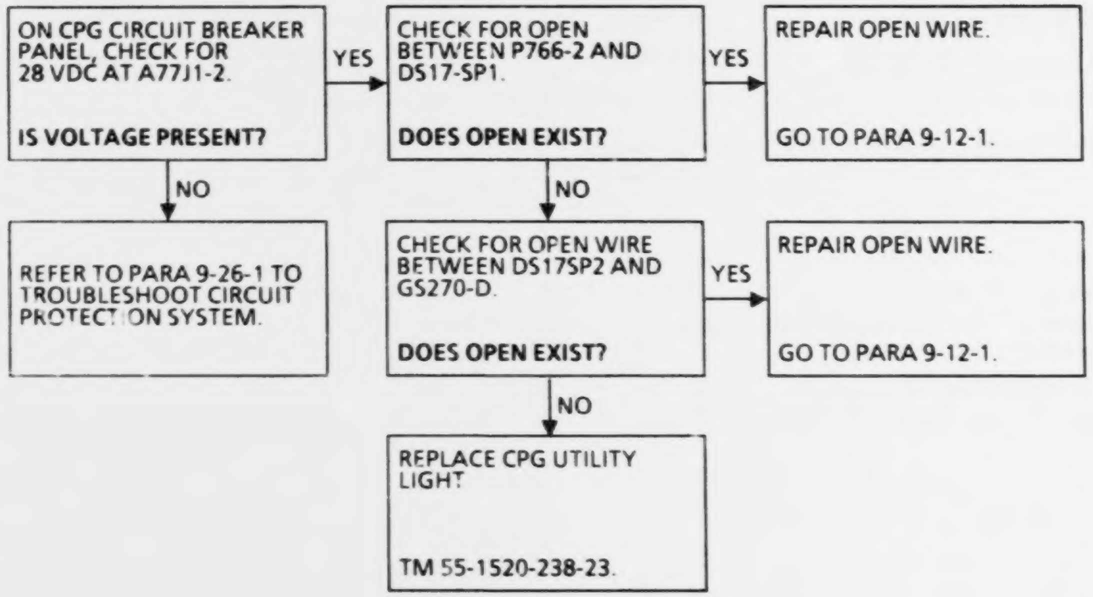
Personnel Required: (para 9-12-4)

References: (para 9-12-4)

Equipment Conditions: (para 9-12-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A77J1-2. **IS VOLTAGE PRESENT?**

NO: REFER TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

YES: CHECK FOR OPEN BETWEEN P766-2 AND DS17-SP1. **DOES OPEN EXIST?**

YES: REPAIR OPEN WIRE. GO TO PARA 9-12-1.

NO: CHECK FOR OPEN WIRE BETWEEN DS17SP2 AND GS270-D. **DOES OPEN EXIST?**

YES: REPAIR OPEN WIRE. GO TO PARA 9-12-1.

NO: REPLACE CPG UTILITY LIGHT. TM 55-1520-238-23.

END OF TASK

9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

References:

TM 55-1520-238-23

Equipment Conditions:

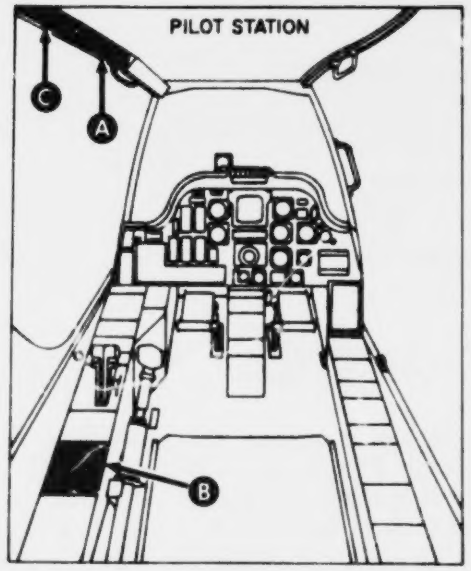
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

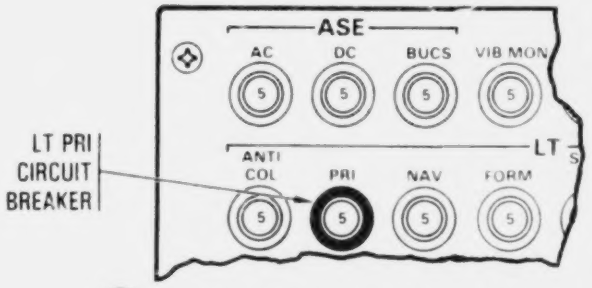
Personnel Required:

68F10 Aircraft Electrician

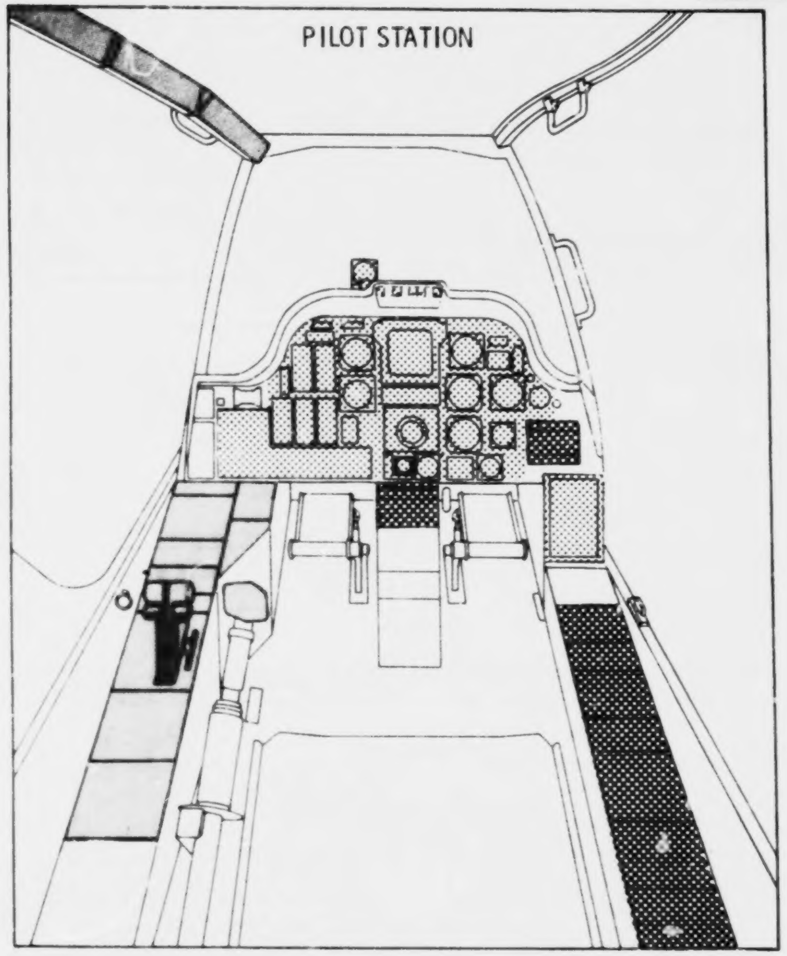
A. Perform operational check as follows:

	TASK	FUNCTION
1.	On pilot center circuit breaker panel, check that LT PRI circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-13-4.
1.1	On pilot AFT circuit breaker panel, set EDGE LT PNL switch to ON.	
1.2	On pilot INT LT panel, set L CSL, R/CTR CSL, and INST to BRT.	
1.3	On pilot instrument panel, left console, and right/center console, check that all edge-lights are lighted.	If any pilot edge-lights are not lighted, go to step 2. If all pilot edge-lights are lighted, go to step B. If all pilot edge-lights are not lighted, go to para 9-13-20.
2.	On pilot left console, check that all edge-lights controlled by L CSL are lighted.	If all pilot left console edge-lights are not lighted, go to para 9-13-5.
3.	On pilot right/center console, check that all edge-lights controlled by R/CTR CSL are lighted.	If all pilot right/center console edge-lights are not lighted, go to para 9-13-6.
4.	On pilot instrument panel, check that all edge-lights controlled by INST are lighted.	If all pilot instrument panel edge-lights are not lighted, go to para 9-13-7.





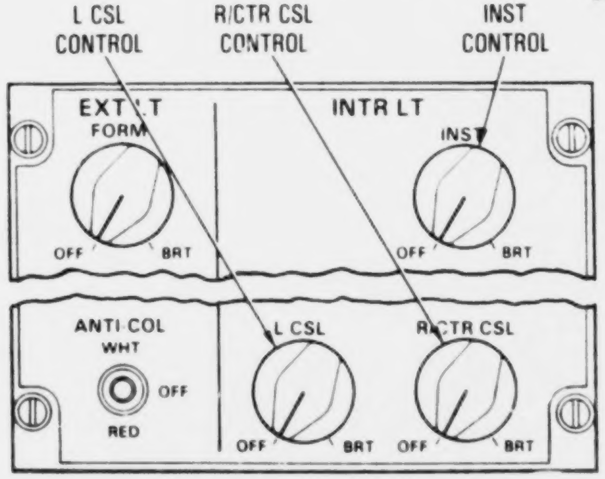
A PILOT CENTER CIRCUIT BREAKER PANEL



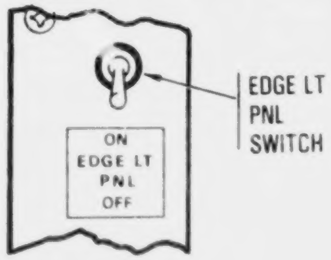
▢ EDGE LIGHTS CONTROLLED BY L CSL

▨ EDGE LIGHTS CONTROLLED BY INST

■ EDGE LIGHTS CONTROLLED BY R/CTR CSL



B PILOT EXT LT/INTR LT PANEL



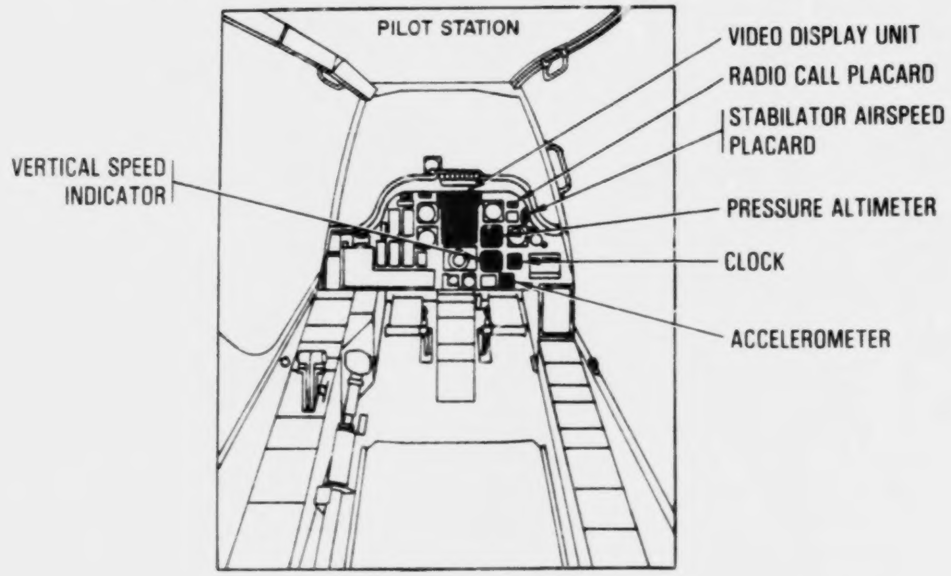
C PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1027-1

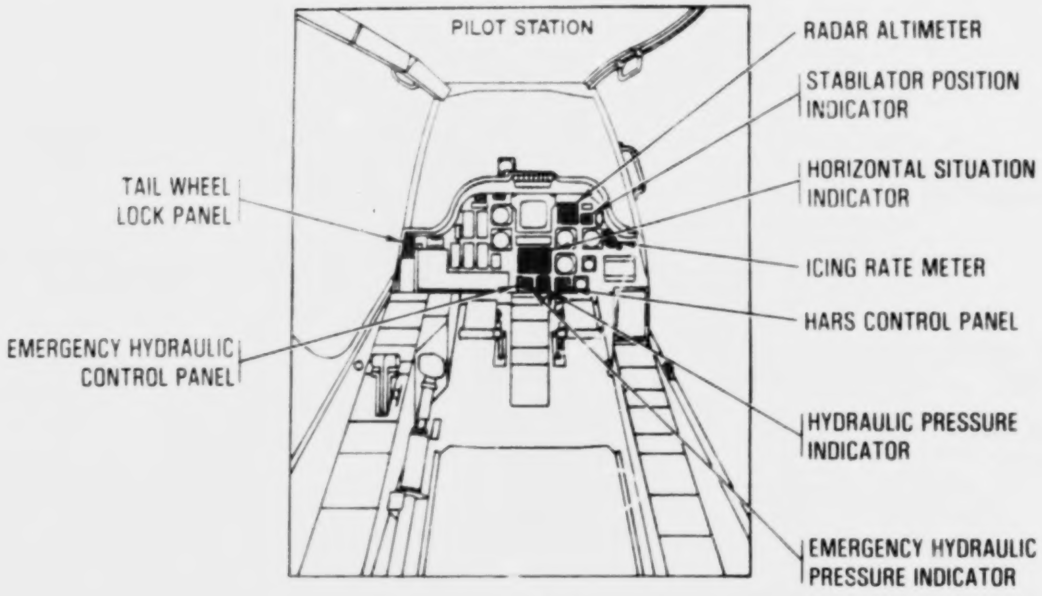
GO TO NEXT PAGE

9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK (cont)

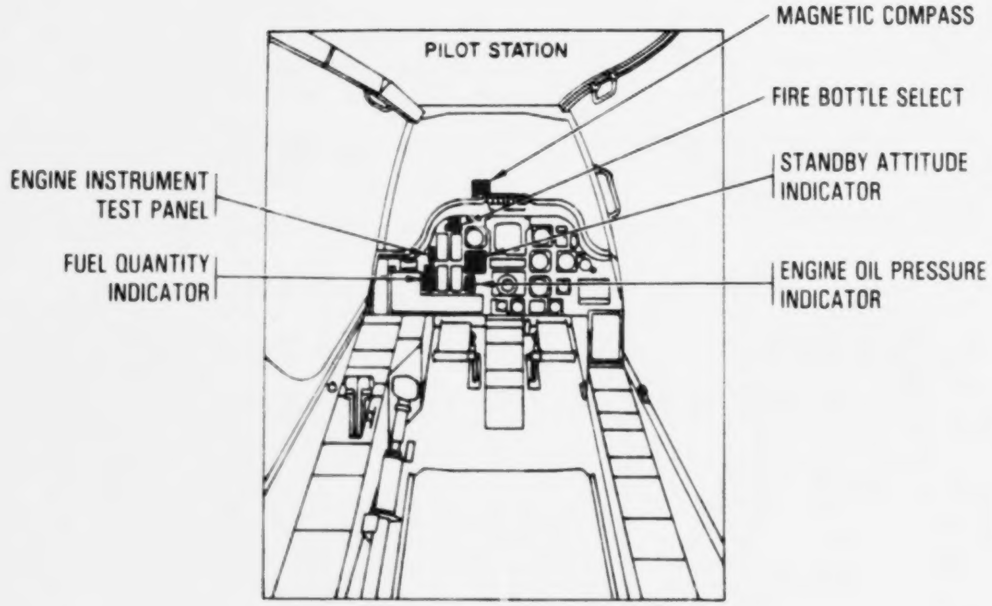
TASK	RESULT
5. Check that **EXT LT/INTR LT** edge-light panel is lighted.	If **EXT LT/INTR LT** edge-light panel is not lighted, go to para 9-13-19.
6. Check that all CH. 1 NO. 1 indicators edge-lights are lighted.	If all CH. 1 NO. 1 indicators are not lighted, go to para 9-13-8.
7. Check that all CH. 1 NO. 2 indicators are lighted.	If all CH. 1 NO. 2 indicators are not lighted, go to para 9-13-9.
8. Check that all CH. 2 NO. 1 indicators are lighted.	If all CH. 2 NO. 1 indicators are not lighted, go to para 9-13-10.



CH. 1 NO. 1


PILOT STATION
RADAR ALTIMETER
STABILATOR POSITION INDICATOR
HORIZONTAL SITUATION INDICATOR
TAIL WHEEL LOCK PANEL
ICING RATE METER
HARS CONTROL PANEL
EMERGENCY HYDRAULIC CONTROL PANEL
HYDRAULIC PRESSURE INDICATOR
EMERGENCY HYDRAULIC PRESSURE INDICATOR

CH. 1 NO. 2

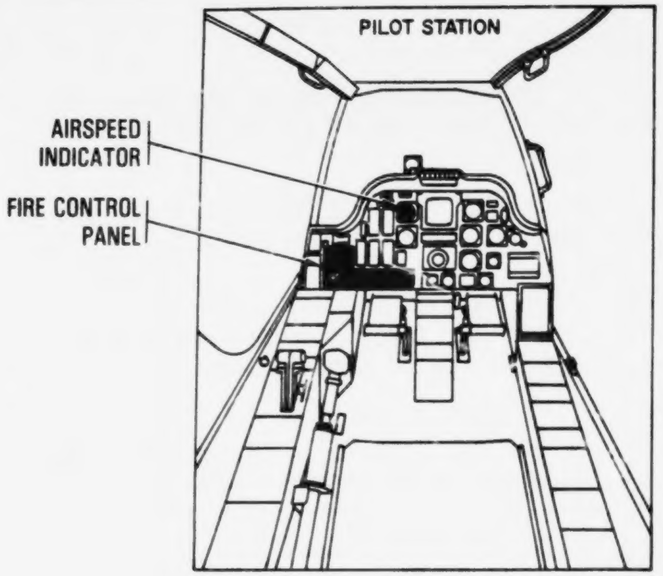

MAGNETIC COMPASS
PILOT STATION
FIRE BOTTLE SELECT
STANDBY ATTITUDE INDICATOR
ENGINE INSTRUMENT TEST PANEL
FUEL QUANTITY INDICATOR
ENGINE OIL PRESSURE INDICATOR

CH. 2 NO. 1

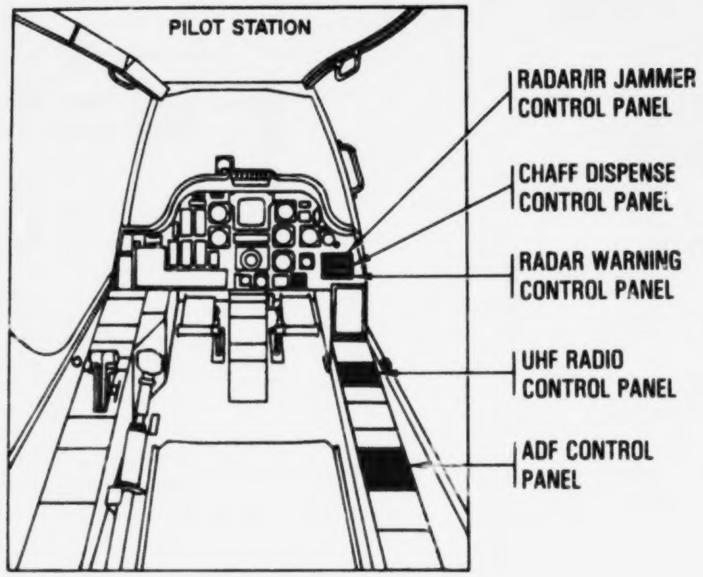
MM04/1-1027-2

GO TO NEXT PAGE

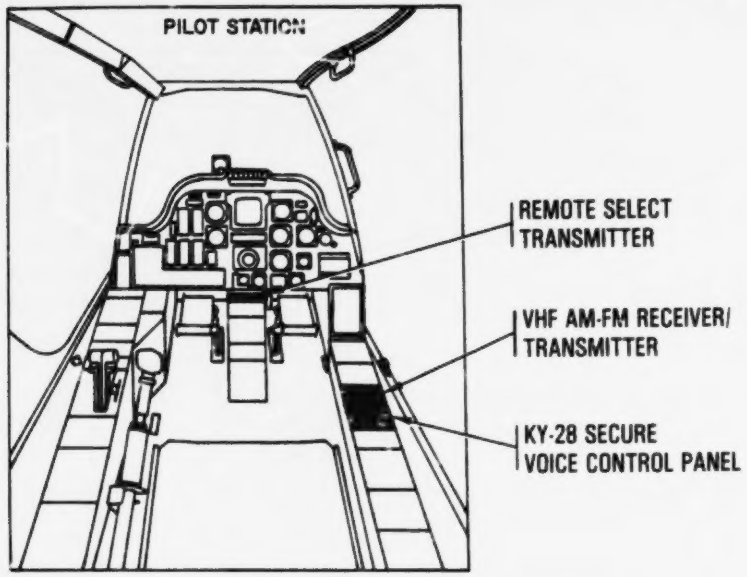
9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK (cont)



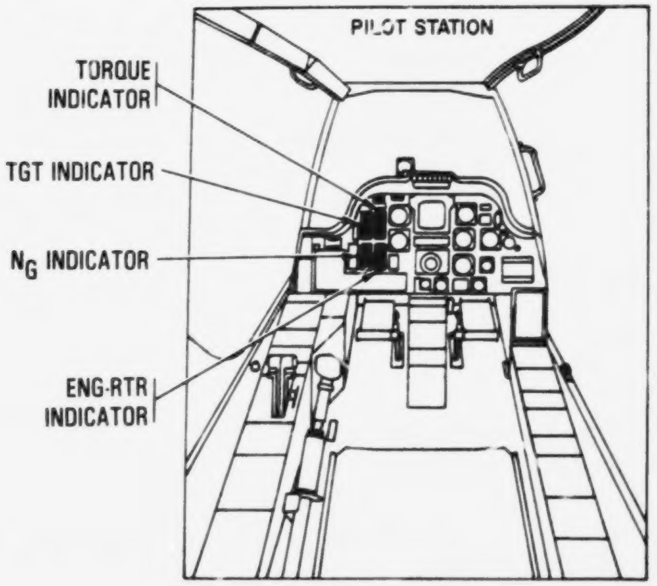
CH. 2 NO. 2


PILOT STATION
RADAR/IR JAMMER CONTROL PANEL
CHAFF DISPENSE CONTROL PANEL
RADAR WARNING CONTROL PANEL
UHF RADIO CONTROL PANEL
ADF CONTROL PANEL

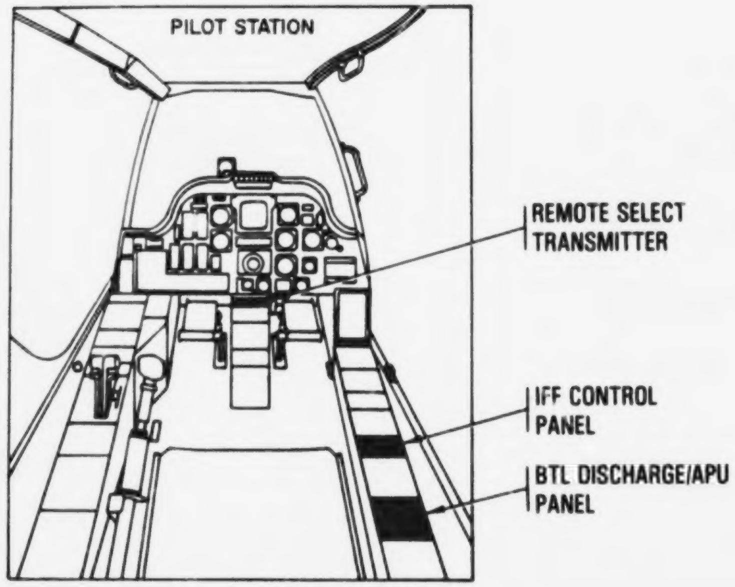
CH. 3 NO. 1


PILOT STATION
REMOTE SELECT TRANSMITTER
VHF AM-FM RECEIVER/ TRANSMITTER
KY-28 SECURE VOICE CONTROL PANEL

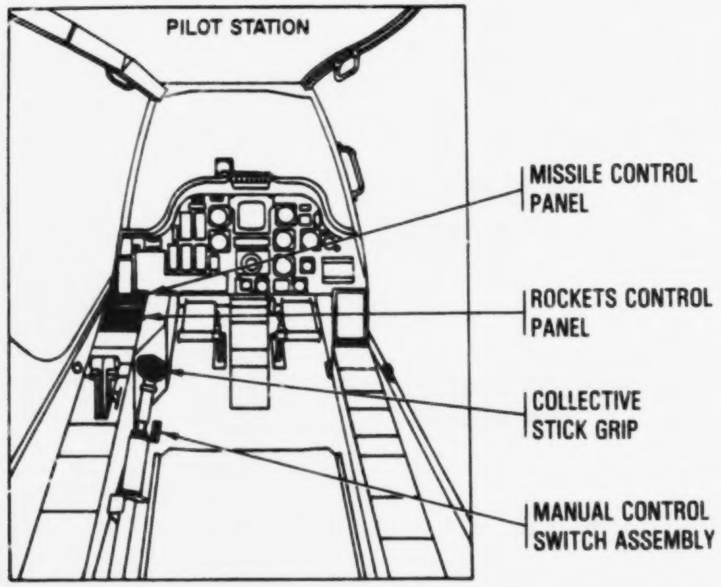
CH. 3 NO. 3



CH. 2 NO. 3



CH. 3 NO. 2

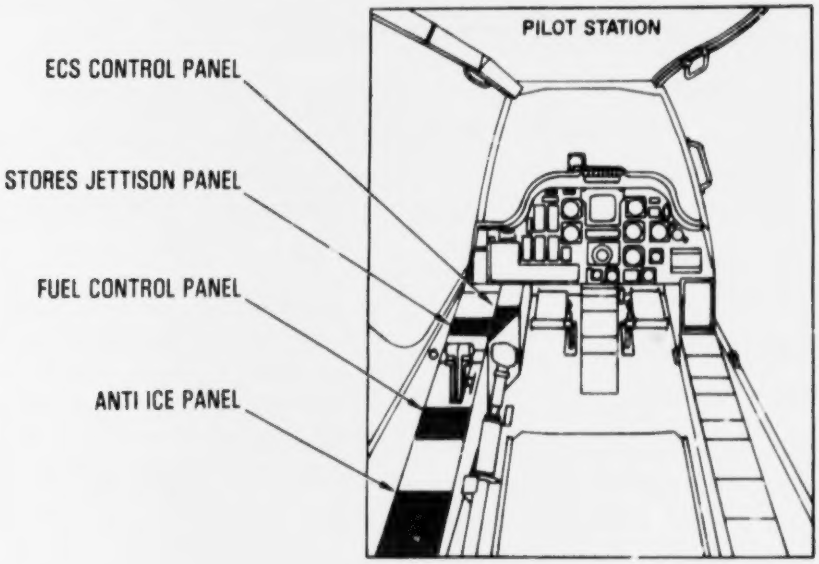


CH. 4 NO. 1

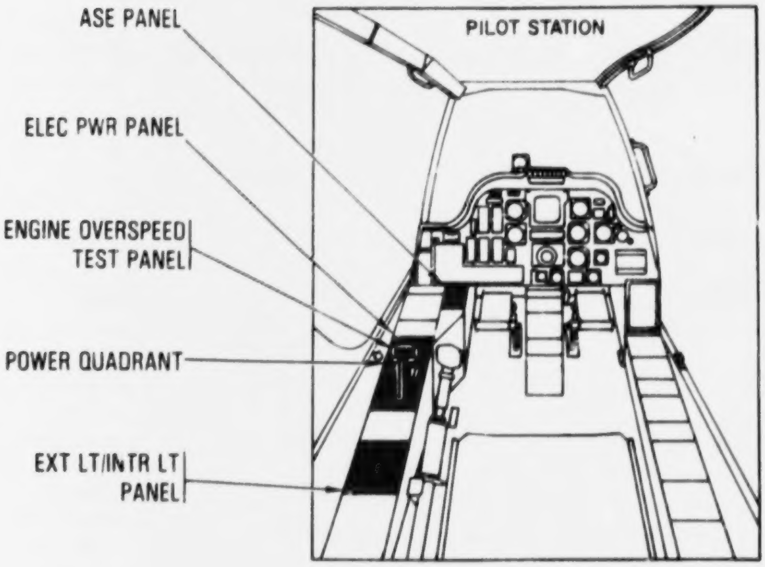
MM04/1-1027-3

GO TO NEXT PAGE

9-13-1. PILOT EDGE-LIGHT - OPERATIONAL CHECK (cont)



CH. 4 NO. 2



CH. 4 NO. 4

MM04/1-1027-4

TASK	RESULT
9. Check that all CH. 2, No. 2 indicators are lighted.	If all CH. 2, No. 2 indicators are not lighted, go to para 9-13-11.
10. Check that all CH. 2, No. 3 indicators are lighted.	If all CH. 2, No. 3 indicators are not lighted, go to para 9-13-12.
11. Rotate **INST** control to **OFF**. Check that all CH. 3, No. 1 control panel edge-lights are lighted.	If all CH. 3, No. 1 control panels are not lighted, go to para 9-13-13.
12. Check that all CH. 3, No. 2 control panels are lighted.	If all CH. 3, No. 2 control panels are not lighted, go to para 9-13-14.
13. Check that all CH. 3, No. 3 control panels are lighted.	If all CH. 3, No. 3 control panels are not lighted, go to para 9-13-15.
14. Rotate **R/CTR CSL** control to **OFF**. Check that all CH. 4, No. 1 control panel edge-lights are lighted.	If all CH. 4, No. 1 control panels are not lighted, go to para 9-13-16.
15. Check that all CH. 4, No. 2 control panels are lighted.	If all CH. 4, No. 2 control panels are not lighted, go to para 9-13-17.
16. Check that all CH. 4, No. 4 control panels are lighted.	If all CH. 4, No. 4 control panels are not lighted, go to para 9-13-18.

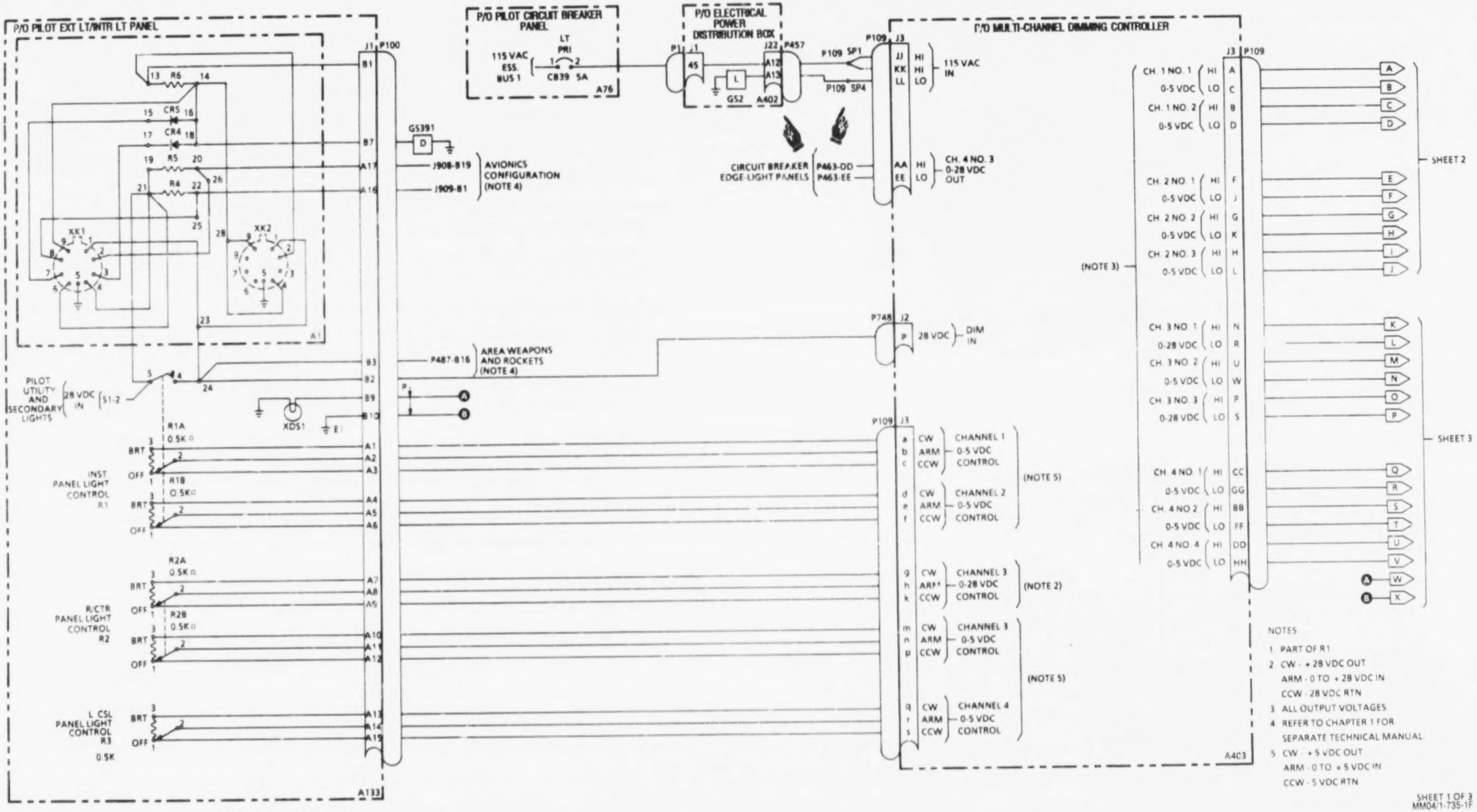
B. On pilot **AFT** circuit breaker panel, set **EDGE LT PNL** switch to **OFF**.

C. On pilot **EXT LT/INTR LT** panel, rotate **L CSL** control to **OFF**.

D. Remove EXTERNAL POWER - ELECTRICAL (TM 55-1520-238-23).

END OF TASK

9-13-2. PILOT EDGE-LIGHT - INTERCONNECTION DIAGRAM

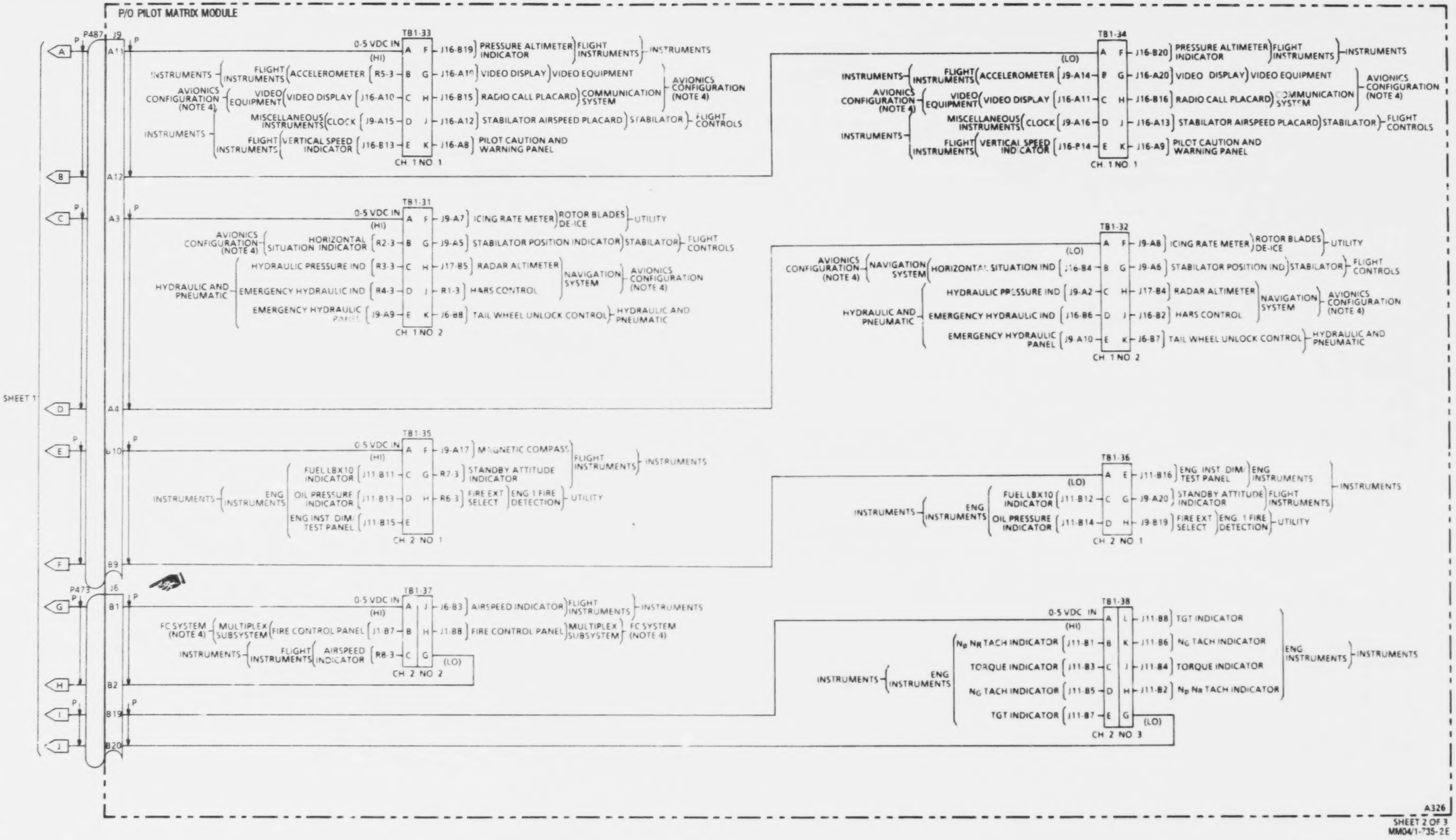

P/O PILOT EXT LT/INTR LT PANEL
A1
A133
J1 P100
R6
CR5
CR4
R5
R4
XK1
XK2
GS391
D
AVIONICS CONFIGURATION (NOTE 4)
J908-B19
J909-B1
AREA WEAPONS AND ROCKETS (NOTE 4)
P487-B16
PILOT UTILITY AND SECONDARY LIGHTS
28 VDC IN
S1-2
XDS1
E1
A
B
INST PANEL LIGHT CONTROL R1
R1A 0.5KΩ
R1B 0.5KΩ
R/CTR PANEL LIGHT CONTROL R2
R2A 0.5KΩ
R2B 0.5KΩ
L CSL PANEL LIGHT CONTROL R3
0.5K
BRT
OFF
P/O PILOT CIRCUIT BREAKER PANEL
115 VAC ESS. BUS 1
LT PRI
CB39 5A
A76
P/O ELECTRICAL POWER DISTRIBUTION BOX
P1 J1
45
J22 P457
A12
A13
GS2
A402
P109 SP1
P109 SP4
CIRCUIT BREAKER EDGE-LIGHT PANELS
P463-DD
P463-EE
P/O MULTI-CHANNEL DIMMING CONTROLLER
P109 J3
JJ HI
KK HI
LL LO
115 VAC IN
AA HI
EE LO
CH. 4 NO. 3 0-28 VDC OUT
P748 J2
P 28 VDC
DIM IN
a CW
b ARM
c CCW
CHANNEL 1 0-5 VDC CONTROL
d CW
e ARM
f CCW
CHANNEL 2 0-5 VDC CONTROL
(NOTE 5)
g CW
h ARM
k CCW
CHANNEL 3 0-28 VDC CONTROL
(NOTE 2)
m CW
n ARM
p CCW
CHANNEL 3 0-5 VDC CONTROL
q CW
r ARM
s CCW
CHANNEL 4 0-5 VDC CONTROL
(NOTE 5)
A403
J3 P109
CH. 1 NO. 1 0-5 VDC HI A LO C
CH. 1 NO. 2 0-5 VDC HI B LO D
CH. 2 NO. 1 0-5 VDC HI F LO J
CH. 2 NO. 2 0-5 VDC HI G LO K
CH. 2 NO. 3 0-5 VDC HI H LO L
(NOTE 3)
CH. 3 NO. 1 0-28 VDC HI N LO R
CH. 3 NO. 2 0-5 VDC HI U LO W
CH. 3 NO. 3 0-28 VDC HI P LO S
CH. 4 NO. 1 0-5 VDC HI CC LO GG
CH. 4 NO. 2 0-5 VDC HI BB LO FF
CH. 4 NO. 4 0-5 VDC HI DD LO HH
A B C D E F G H I J
SHEET 2
K L M N O P Q R S T U V W X
SHEET 3

NOTES

1. PART OF R1
2. CW - +28 VDC OUT
   ARM - 0 TO +28 VDC IN
   CCW - 28 VDC RTN
3. ALL OUTPUT VOLTAGES
4. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL
5. CW - +5 VDC OUT
   ARM - 0 TO +5 VDC IN
   CCW - 5 VDC RTN

SHEET 1 OF 3
MM04/1-735-1F

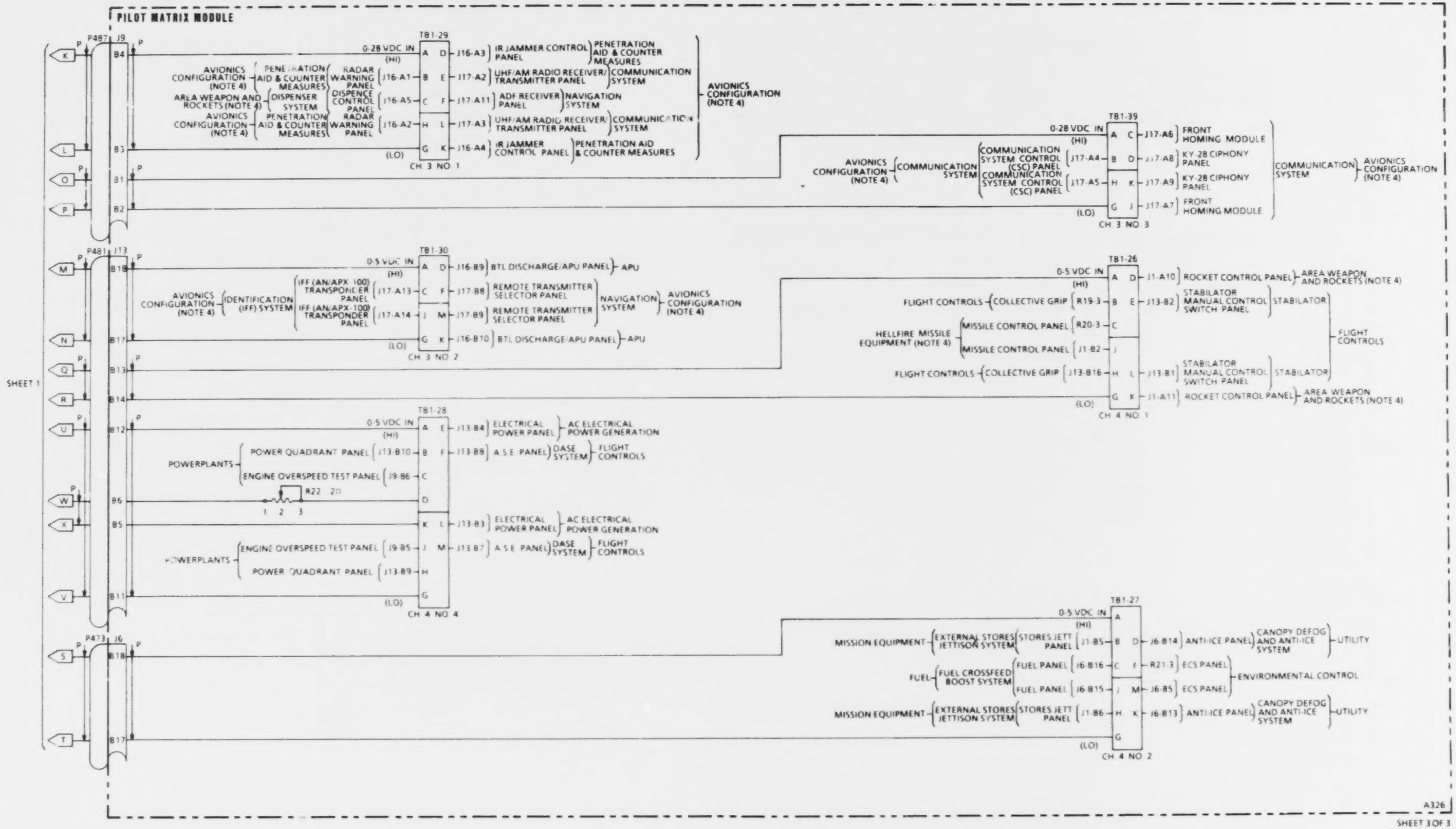
9-13-2. PILOT EDGE-LIGHT - INTERCONNECTION DIAGRAM (cont)



P/O PILOT MATRIX MODULE
SHEET 1
A
B
C
D
E
F
G
H
I
J
P487
J9
P473
J6
P
A11
A12
A3
A4
B10
B9
B1
B2
B19
B20
TB1-33
0-5 VDC IN
(HI)
A F J16-B19 PRESSURE ALTIMETER INDICATOR FLIGHT INSTRUMENTS INSTRUMENTS
INSTRUMENTS FLIGHT INSTRUMENTS ACCELEROMETER R5-3 B G J16-A19 VIDEO DISPLAY VIDEO EQUIPMENT
AVIONICS CONFIGURATION (NOTE 4) VIDEO EQUIPMENT VIDEO DISPLAY J16-A10 C H J16-B15 RADIO CALL PLACARD COMMUNICATION SYSTEM AVIONICS CONFIGURATION (NOTE 4)
MISCELLANEOUS INSTRUMENTS CLOCK J9-A15 D J J16-A12 STABILATOR AIRSPEED PLACARD STABILATOR FLIGHT CONTROLS
INSTRUMENTS FLIGHT INSTRUMENTS VERTICAL SPEED INDICATOR J16-B13 E K J16-A8 PILOT CAUTION AND WARNING PANEL
CH 1 NO 1
TB1-34
(LO)
A F J16-B20 PRESSURE ALTIMETER INDICATOR FLIGHT INSTRUMENTS INSTRUMENTS
INSTRUMENTS FLIGHT INSTRUMENTS ACCELEROMETER J9-A14 B G J16-A20 VIDEO DISPLAY VIDEO EQUIPMENT
AVIONICS CONFIGURATION (NOTE 4) VIDEO EQUIPMENT VIDEO DISPLAY J16-A11 C H J16-B16 RADIO CALL PLACARD COMMUNICATION SYSTEM AVIONICS CONFIGURATION (NOTE 4)
MISCELLANEOUS INSTRUMENTS CLOCK J9-A16 D J J16-A13 STABILATOR AIRSPEED PLACARD STABILATOR FLIGHT CONTROLS
INSTRUMENTS FLIGHT INSTRUMENTS VERTICAL SPEED INDICATOR J16-B14 E K J16-A9 PILOT CAUTION AND WARNING PANEL
CH 1 NO 1
TB1-31
0-5 VDC IN
(HI)
A F J9-A7 ICING RATE METER ROTOR BLADES DE-ICE UTILITY
AVIONICS CONFIGURATION (NOTE 4) HORIZONTAL SITUATION INDICATOR R2-3 B G J9-A5 STABILATOR POSITION INDICATOR STABILATOR FLIGHT CONTROLS
HYDRAULIC PRESSURE IND R3-3 C H J17-B5 RADAR ALTIMETER NAVIGATION SYSTEM AVIONICS CONFIGURATION (NOTE 4)
HYDRAULIC AND PNEUMATIC EMERGENCY HYDRAULIC IND R4-3 D J R1-3 HARS CONTROL
EMERGENCY HYDRAULIC PANEL J9-A9 E K J6-B8 TAIL WHEEL UNLOCK CONTROL HYDRAULIC AND PNEUMATIC
CH 1 NO 2
TB1-32
(LO)
A F J9-A8 ICING RATE METER ROTOR BLADES DE-ICE UTILITY
AVIONICS CONFIGURATION (NOTE 4) NAVIGATION SYSTEM HORIZONTAL SITUATION IND J16-B4 B G J9-A6 STABILATOR POSITION IND STABILATOR FLIGHT CONTROLS
HYDRAULIC PRESSURE IND J9-A2 C H J17-B4 RADAR ALTIMETER NAVIGATION SYSTEM AVIONICS CONFIGURATION (NOTE 4)
HYDRAULIC AND PNEUMATIC EMERGENCY HYDRAULIC IND J16-B6 D J J16-B2 HARS CONTROL
EMERGENCY HYDRAULIC PANEL J9-A10 E K J6-B7 TAIL WHEEL UNLOCK CONTROL HYDRAULIC AND PNEUMATIC
CH 1 NO 2
TB1-35
0-5 VDC IN
(HI)
A F J9-A17 MAGNETIC COMPASS FLIGHT INSTRUMENTS INSTRUMENTS
FUEL LBX10 INDICATOR J11-B11 C G R7-3 STANDBY ATTITUDE INDICATOR
INSTRUMENTS ENG INSTRUMENTS OIL PRESSURE INDICATOR J11-B13 D H R6-3 FIRE EXT SELECT ENG 1 FIRE DETECTION UTILITY
ENG INST DIM/ TEST PANEL J11-B15 E
CH 2 NO 1
TB1-36
(LO)
A E J11-B16 ENG INST DIM/ TEST PANEL ENG INSTRUMENTS INSTRUMENTS
INSTRUMENTS ENG INSTRUMENTS FUEL LBX10 INDICATOR J11-B12 C G J9-A20 STANDBY ATTITUDE INDICATOR FLIGHT INSTRUMENTS
OIL PRESSURE INDICATOR J11-B14 D H J9-B19 FIRE EXT SELECT ENG 1 FIRE DETECTION UTILITY
CH 2 NO 1
TB1-37
0-5 VDC IN
(HI)
A J J6-B3 AIRSPEED INDICATOR FLIGHT INSTRUMENTS INSTRUMENTS
FC SYSTEM (NOTE 4) MULTIPLEX SUBSYSTEM FIRE CONTROL PANEL J1-B7 B H J1-B8 FIRE CONTROL PANEL MULTIPLEX SUBSYSTEM FC SYSTEM (NOTE 4)
INSTRUMENTS FLIGHT INSTRUMENTS AIRSPEED INDICATOR R8-3 C G
(LO)
CH 2 NO 2
TB1-38
0-5 VDC IN
(HI)
A L J11-B8 TGT INDICATOR
N_P N_R TACH INDICATOR J11-B1 B K J11-B6 N_G TACH INDICATOR
INSTRUMENTS ENG INSTRUMENTS TORQUE INDICATOR J11-B3 C J J11-B4 TORQUE INDICATOR ENG INSTRUMENTS INSTRUMENTS
N_G TACH INDICATOR J11-B5 D H J11-B2 N_P N_R TACH INDICATOR
TGT INDICATOR J11-B7 E G
(LO)
CH 2 NO 3
A326

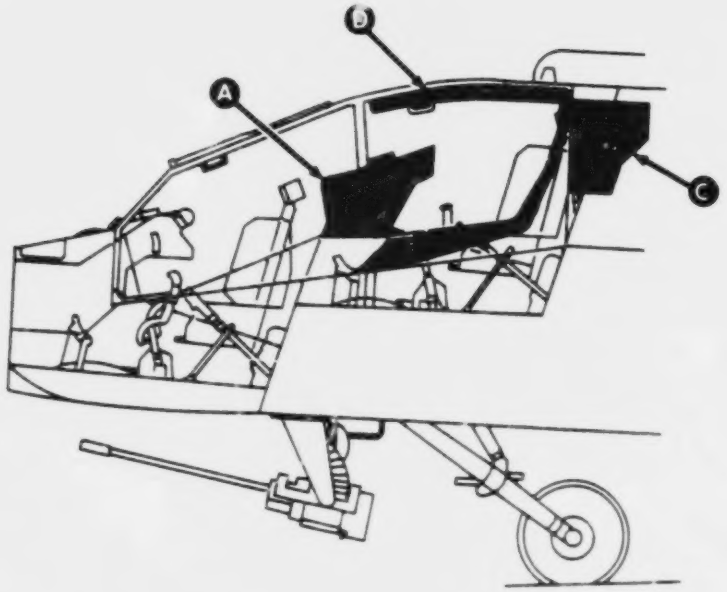
SHEET 2 OF 3
MM04/1-735-2E

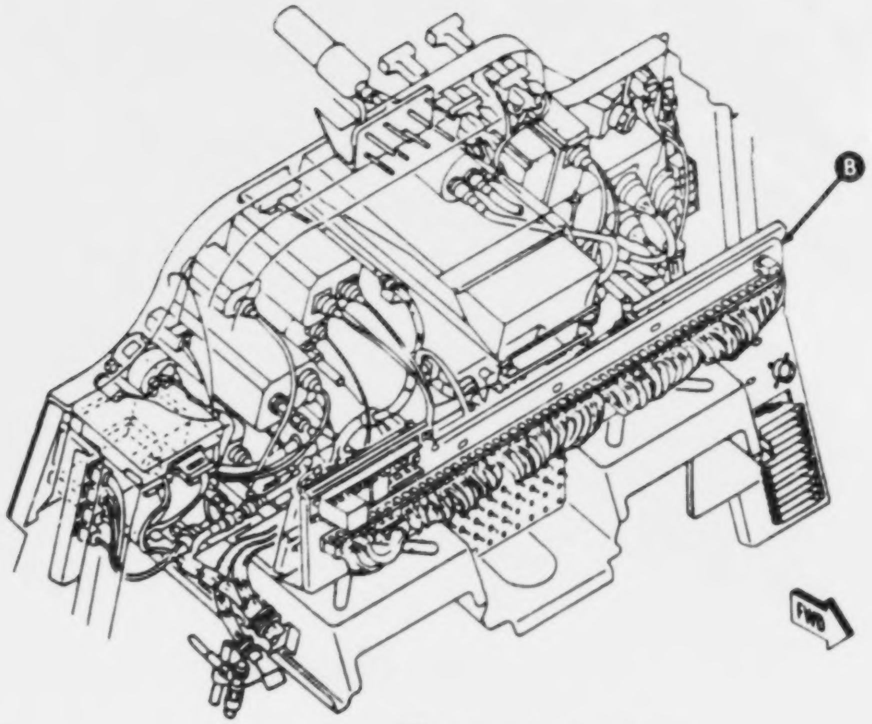
9-13-2. PILOT EDGE-LIGHT - INTERCONNECTION DIAGRAM (cont)


PILOT MATRIX MODULE
SHEET 1
P487 J9
P481 J13
P473 J6
K
L
O
P
M
N
Q
R
U
W
X
V
S
T
B4
B3
B1
B2
B18
B17
B13
B14
B12
B6
B5
B11
TB1-29
0-28 VDC IN (HI)
(LO)
CH 3 NO 1
J16-A3 IR JAMMER CONTROL PANEL
PENETRATION AID & COUNTER MEASURES
J17-A2 UHF/AM RADIO RECEIVER/TRANSMITTER PANEL
COMMUNICATION SYSTEM
J17-A11 ADF RECEIVER PANEL
NAVIGATION SYSTEM
J17-A3 UHF/AM RADIO RECEIVER/TRANSMITTER PANEL
COMMUNICATION SYSTEM
J16-A4 IR JAMMER CONTROL PANEL
PENETRATION AID & COUNTER MEASURES
AVIONICS CONFIGURATION (NOTE 4)
AVIONICS CONFIGURATION (NOTE 4)
PENETRATION AID & COUNTER MEASURES
RADAR WARNING PANEL
J16-A1
AREA WEAPON AND ROCKETS (NOTE 4)
DISPENSER SYSTEM
DISPENCE CONTROL PANEL
J16-A5
AVIONICS CONFIGURATION (NOTE 4)
PENETRATION AID & COUNTER MEASURES
RADAR WARNING PANEL
J16-A2
TB1-39
0-28 VDC IN (HI)
(LO)
CH 3 NO 3
J17-A6 FRONT HOMING MODULE
J17-A8 KY-28 CIPHONY PANEL
J17-A9 KY-28 CIPHONY PANEL
J17-A7 FRONT HOMING MODULE
COMMUNICATION SYSTEM
AVIONICS CONFIGURATION (NOTE 4)
AVIONICS CONFIGURATION (NOTE 4)
COMMUNICATION SYSTEM
COMMUNICATION SYSTEM CONTROL (CSC) PANEL
J17-A4
COMMUNICATION SYSTEM CONTROL (CSC) PANEL
J17-A5
TB1-30
0-5 VDC IN (HI)
(LO)
CH 3 NO 2
J16-B9 BTL DISCHARGE/APU PANEL
APU
J17-B8 REMOTE TRANSMITTER SELECTOR PANEL
J17-B9 REMOTE TRANSMITTER SELECTOR PANEL
NAVIGATION SYSTEM
AVIONICS CONFIGURATION (NOTE 4)
J16-B10 BTL DISCHARGE/APU PANEL
APU
AVIONICS CONFIGURATION (NOTE 4)
IDENTIFICATION (IFF) SYSTEM
IFF (AN/APX-100) TRANSPONDER PANEL
J17-A13
IFF (AN/APX-100) TRANSPONDER PANEL
J17-A14
TB1-26
0-5 VDC IN (HI)
(LO)
CH 4 NO 1
J1-A10 ROCKET CONTROL PANEL
AREA WEAPON AND ROCKETS (NOTE 4)
J13-B2 STABILATOR MANUAL CONTROL SWITCH PANEL
STABILATOR
FLIGHT CONTROLS
J13-B1 STABILATOR MANUAL CONTROL SWITCH PANEL
STABILATOR
J1-A11 ROCKET CONTROL PANEL
AREA WEAPON AND ROCKETS (NOTE 4)
FLIGHT CONTROLS
COLLECTIVE GRIP
R19-3
HELLFIRE MISSILE EQUIPMENT (NOTE 4)
MISSILE CONTROL PANEL
R20-3
MISSILE CONTROL PANEL
J1-B2
FLIGHT CONTROLS
COLLECTIVE GRIP
J13-B16
TB1-28
0-5 VDC IN (HI)
(LO)
CH 4 NO 4
J13-B4 ELECTRICAL POWER PANEL
AC ELECTRICAL POWER GENERATION
J13-B8 A.S.E. PANEL
DASE SYSTEM
FLIGHT CONTROLS
POWERPLANTS
POWER QUADRANT PANEL
J13-B10
ENGINE OVERSPEED TEST PANEL
J9-B6
R22 2Ω
1 2 3
J13-B3 ELECTRICAL POWER PANEL
AC ELECTRICAL POWER GENERATION
J13-B7 A.S.E. PANEL
DASE SYSTEM
FLIGHT CONTROLS
POWERPLANTS
ENGINE OVERSPEED TEST PANEL
J9-B5
POWER QUADRANT PANEL
J13-B9
TB1-27
0-5 VDC IN (HI)
(LO)
CH 4 NO 2
MISSION EQUIPMENT
EXTERNAL STORES JETTISON SYSTEM
STORES JETT PANEL
J1-B5
J6-B14 ANTI-ICE PANEL
CANOPY DEFOG AND ANTI-ICE SYSTEM
UTILITY
FUEL
FUEL CROSSFEED BOOST SYSTEM
FUEL PANEL
J6-B16
R21-3 ECS PANEL
ENVIRONMENTAL CONTROL
FUEL PANEL
J6-B15
J6-B5 ECS PANEL
MISSION EQUIPMENT
EXTERNAL STORES JETTISON SYSTEM
STORES JETT PANEL
J1-B6
J6-B13 ANTI-ICE PANEL
CANOPY DEFOG AND ANTI-ICE SYSTEM
UTILITY
A326

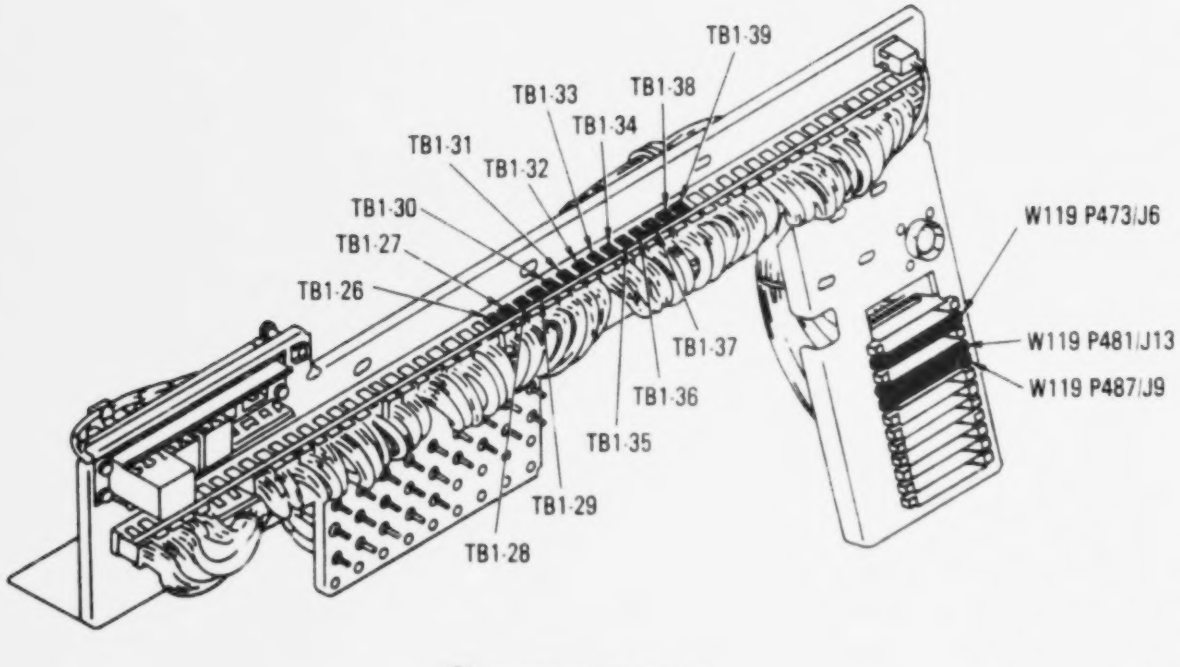
SHEET 3 OF 3
MM04-1-735-3

9-13-3. PILOT EDGE-LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION





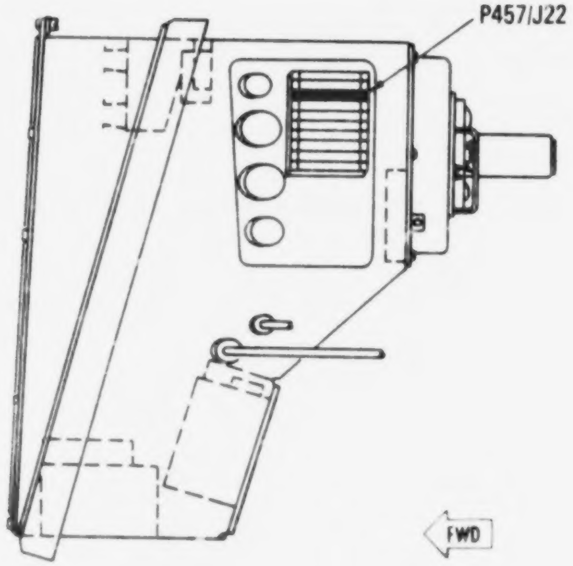
A PILOT INSTRUMENT PANEL



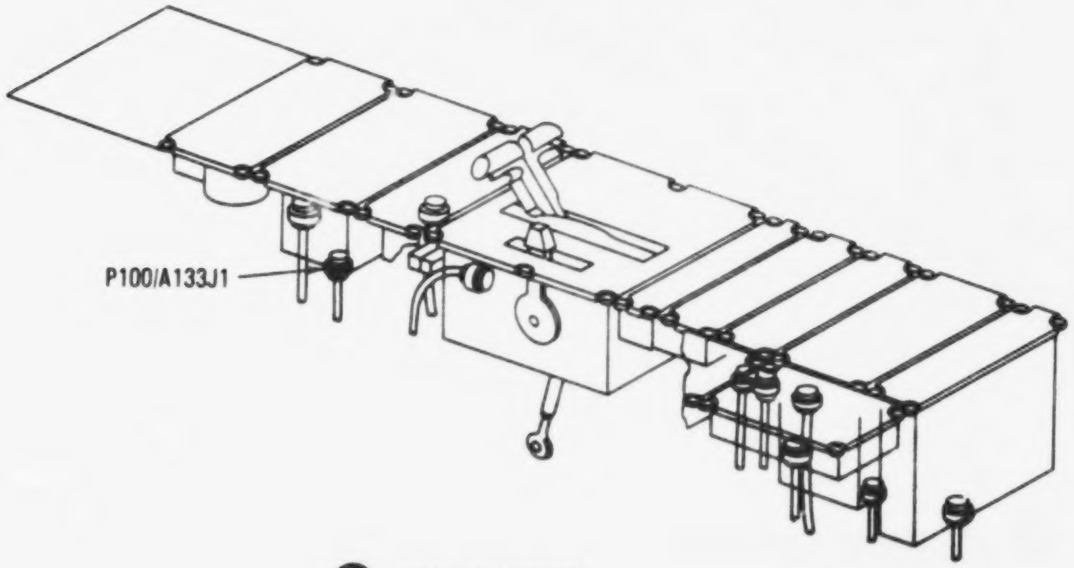
B PILOT MATRIX MODULE

MM04/1-1287-1

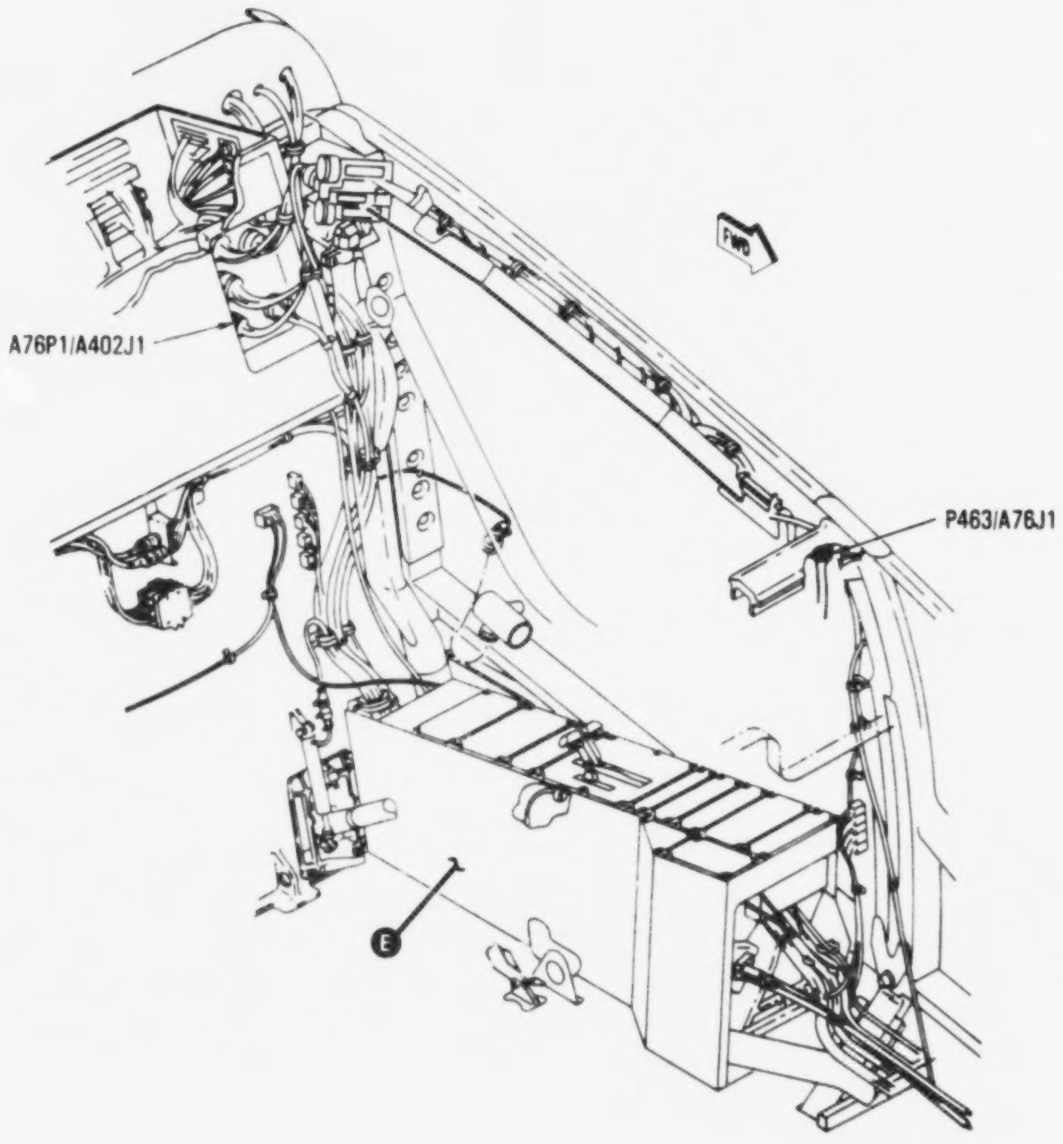
9-13-3. PILOT EDGE-LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



C ELECTRICAL POWER CENTER



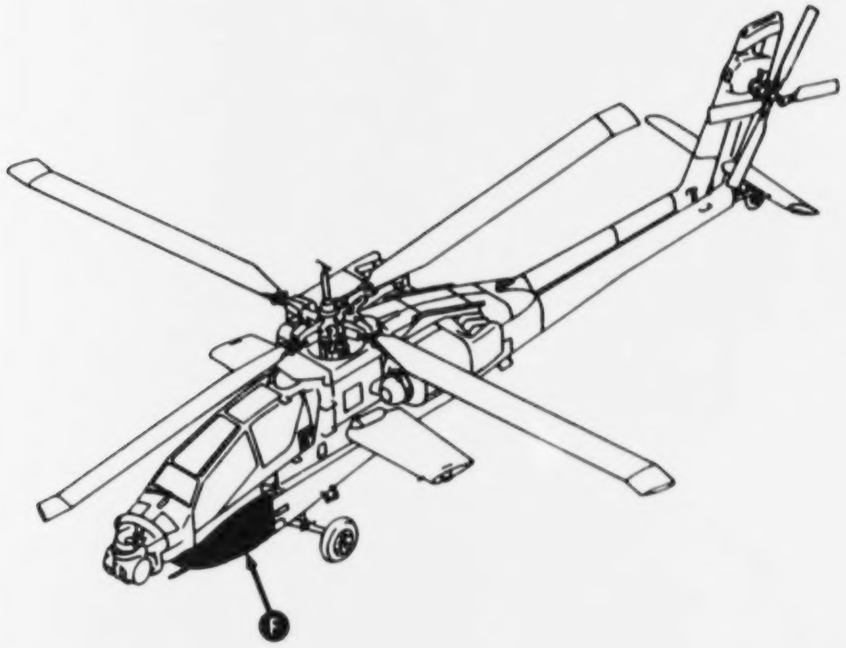
E PILOT LEFT CONSOLE

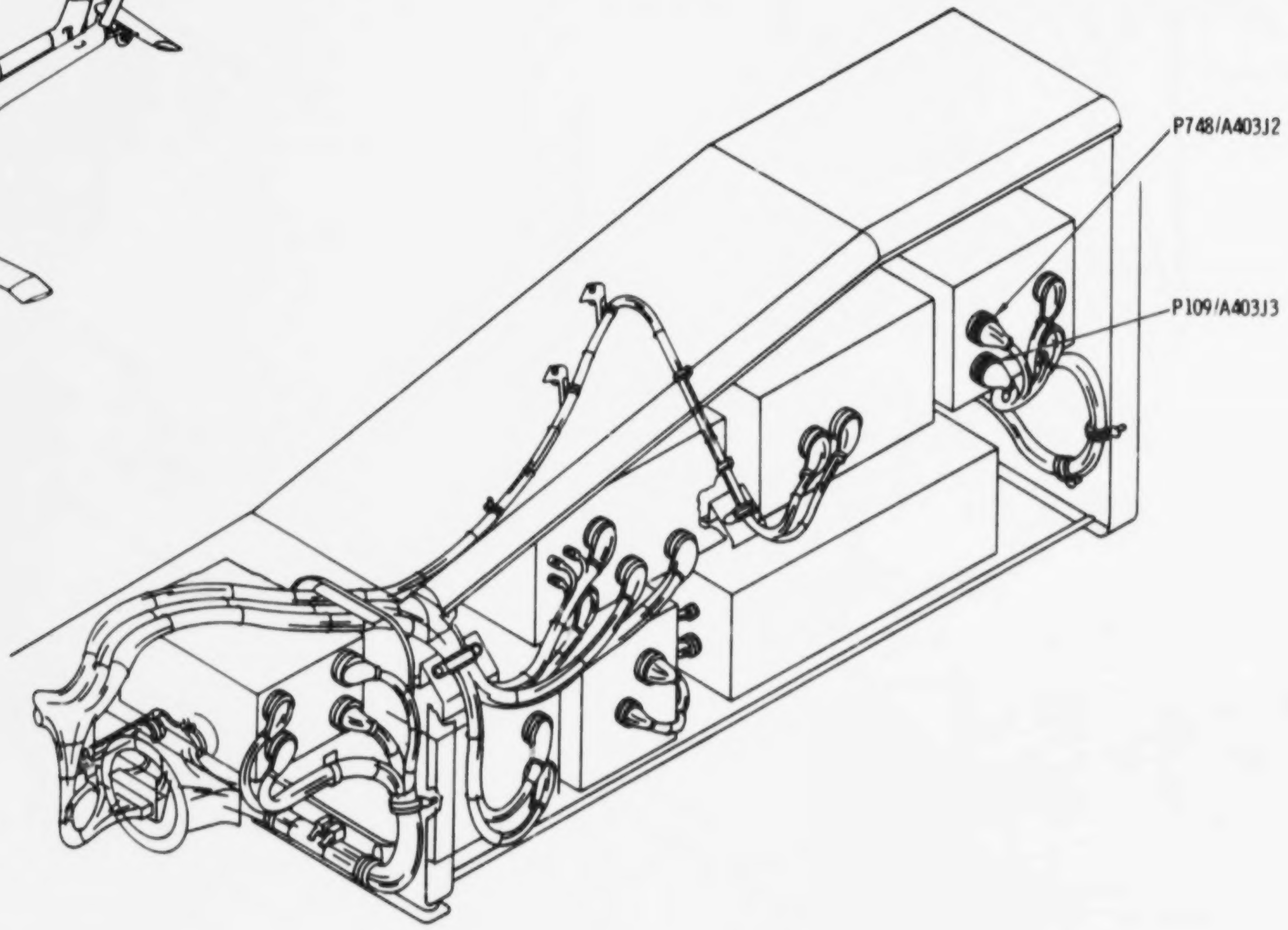


D PILOT STATION

MM04/1-1287-2

9-13-3. PILOT EDGE-LIGHT - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)





F LEFT FORWARD AVIONICS BAY

9-13-4. PILOT LT PRI CIRCUIT BREAKER (CB39) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

References:

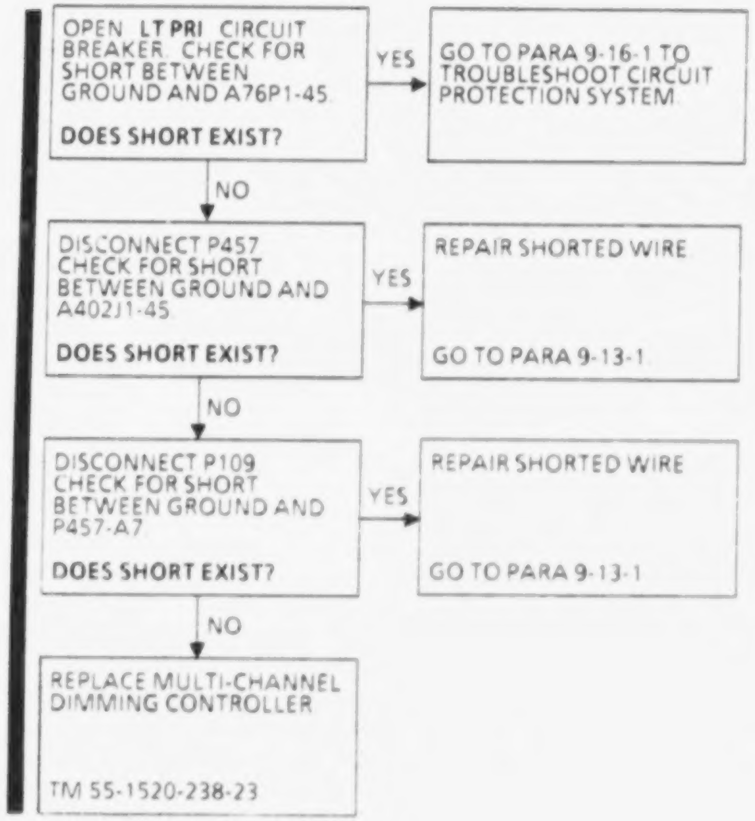
TM 55-1520-238-23

Personnel Required:

68F10 Aircraft Electrician

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN **LT PRI** CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76P1-45.
DOES SHORT EXIST?
YES
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT P457. CHECK FOR SHORT BETWEEN GROUND AND A402J1-45.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT P109. CHECK FOR SHORT BETWEEN GROUND AND P457-A7.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-5. ALL PILOT LEFT CONSOLE EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-13-4)

Personnel Required: (para 9-13-4)

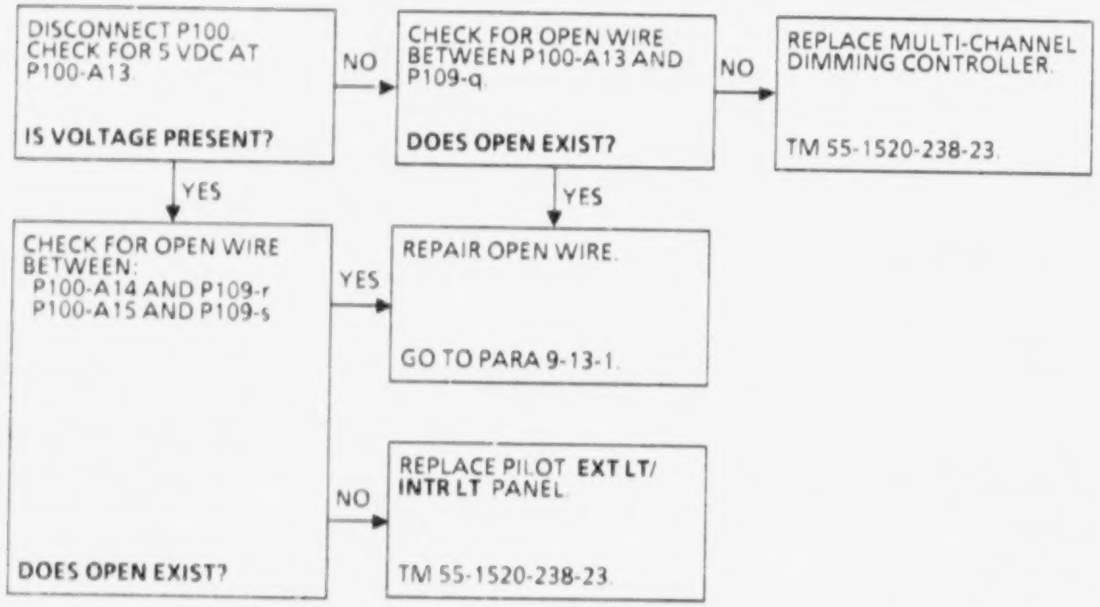
References: (para 9-13-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DISCONNECT P100. CHECK FOR 5 VDC AT P100-A13.
IS VOLTAGE PRESENT?
NO
CHECK FOR OPEN WIRE BETWEEN P100-A13 AND P109-q.
DOES OPEN EXIST?
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
YES
CHECK FOR OPEN WIRE BETWEEN:
P100-A14 AND P109-r
P100-A15 AND P109-s
DOES OPEN EXIST?
YES
NO
REPLACE PILOT **EXT LT/ INTR LT** PANEL.
TM 55-1520-238-23.

END OF TASK

9-13-6. ALL PILOT RIGHT AND CENTER CONSOLE EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

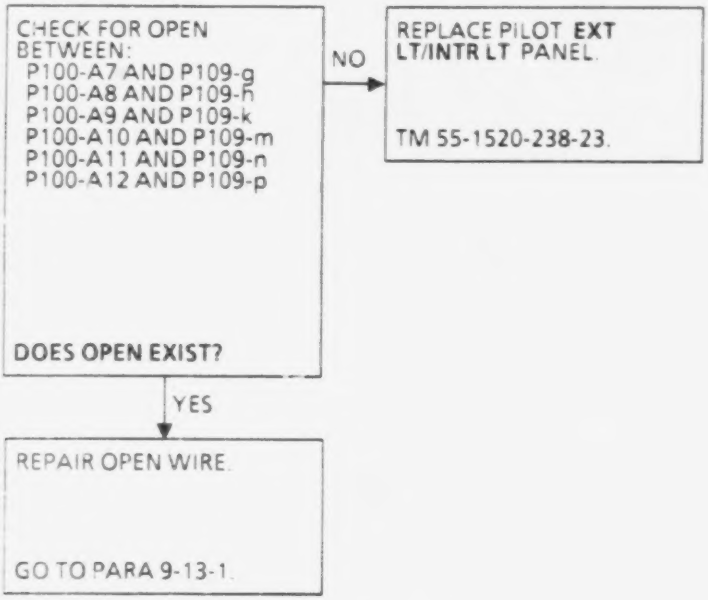
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - Door L90 opened



CHECK FOR OPEN BETWEEN:
P100-A7 AND P109-g
P100-A8 AND P109-h
P100-A9 AND P109-k
P100-A10 AND P109-m
P100-A11 AND P109-n
P100-A12 AND P109-p

DOES OPEN EXIST?

REPLACE PILOT EXT LT/INTR LT PANEL.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-13-1.

END OF TASK

9-13-7. ALL PILOT INSTRUMENT EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-13-6)

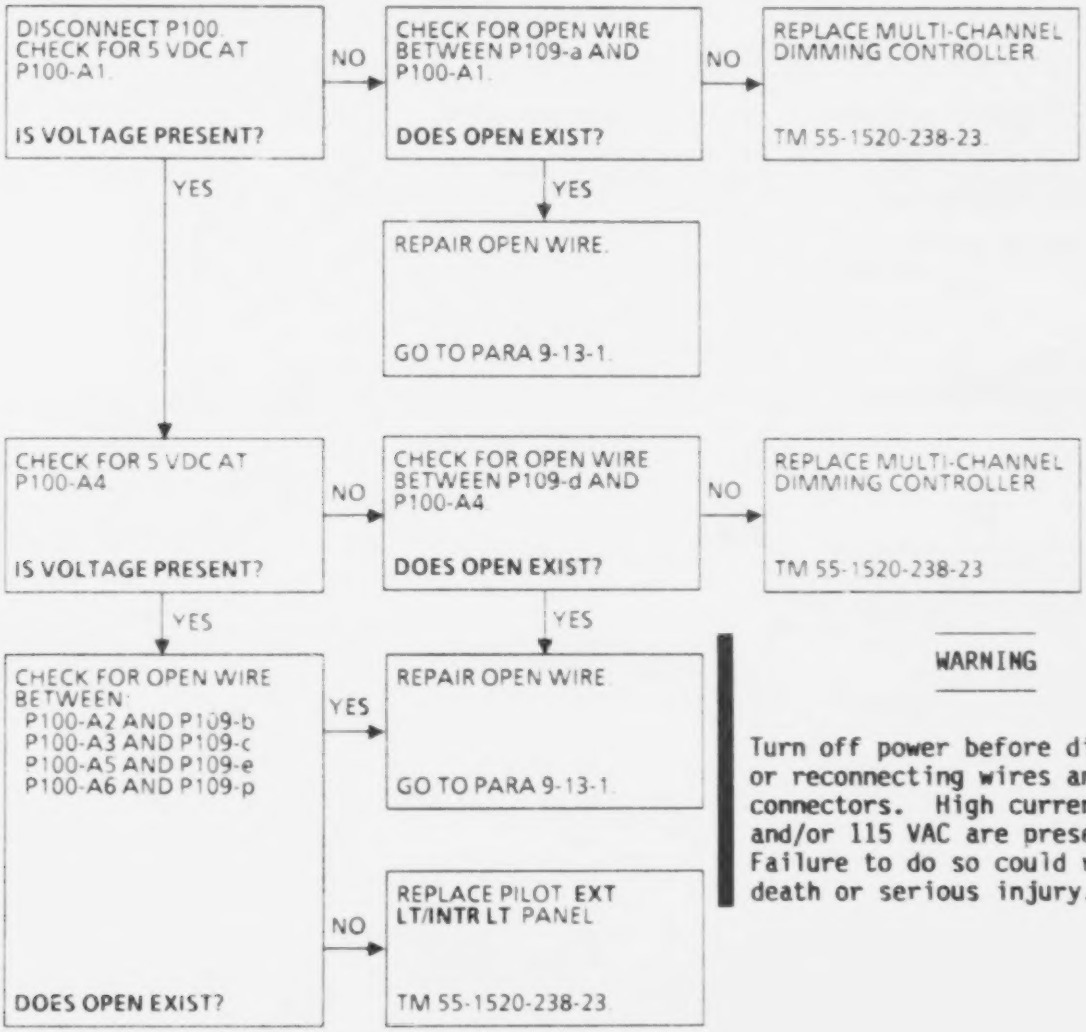
Personnel Required: (para 9-13-6)

References: (para 9-13-6)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 1-3-2	ICS connected
Para 9-5-2	EXTERNAL POWER - POWER UP complete

REFER TO VOLTAGE WARNING



DISCONNECT P100. CHECK FOR 5 VDC AT P100-A1.

IS VOLTAGE PRESENT?

CHECK FOR OPEN WIRE BETWEEN P109-a AND P100-A1.

DOES OPEN EXIST?

REPLACE MULTI-CHANNEL DIMMING CONTROLLER.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-13-1.

CHECK FOR 5 VDC AT P100-A4

IS VOLTAGE PRESENT?

CHECK FOR OPEN WIRE BETWEEN P109-d AND P100-A4

DOES OPEN EXIST?

REPLACE MULTI-CHANNEL DIMMING CONTROLLER

TM 55-1520-238-23

CHECK FOR OPEN WIRE BETWEEN:
P100-A2 AND P109-b
P100-A3 AND P109-c
P100-A5 AND P109-e
P100-A6 AND P109-p

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-13-1.

REPLACE PILOT **EXT LT/INTR LT** PANEL

TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-13-8. ALL CH. 1 NO. 1 EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-13-6)

Personnel Required: (para 9-13-6)

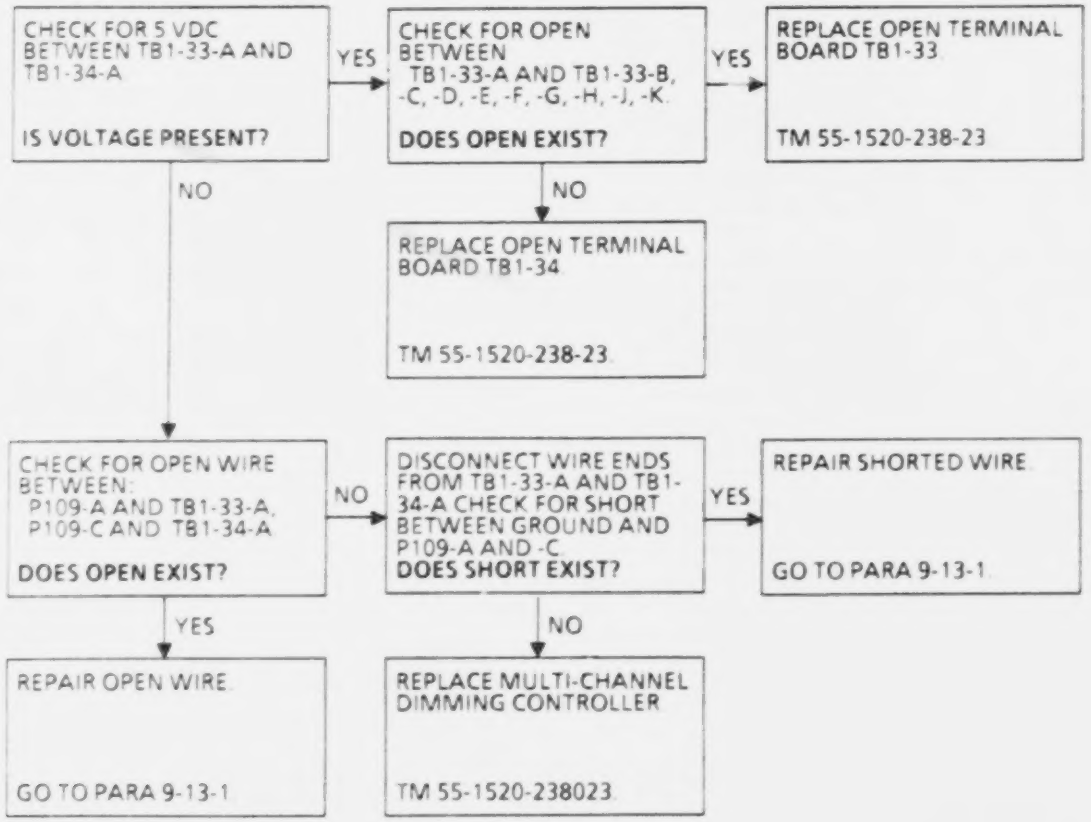
References: (para 9-13-6)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-33-A AND TB1-34-A. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-33-A AND TB1-33-B, -C, -D, -E, -F, -G, -H, -J, -K. DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-33. TM 55-1520-238-23
NO
REPLACE OPEN TERMINAL BOARD TB1-34. TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-A AND TB1-33-A, P109-C AND TB1-34-A. DOES OPEN EXIST?
NO
DISCONNECT WIRE ENDS FROM TB1-33-A AND TB1-34-A CHECK FOR SHORT BETWEEN GROUND AND P109-A AND -C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-13-1.
YES
REPAIR OPEN WIRE. GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238023.

9-13-9. ALL CH. 1 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-6)

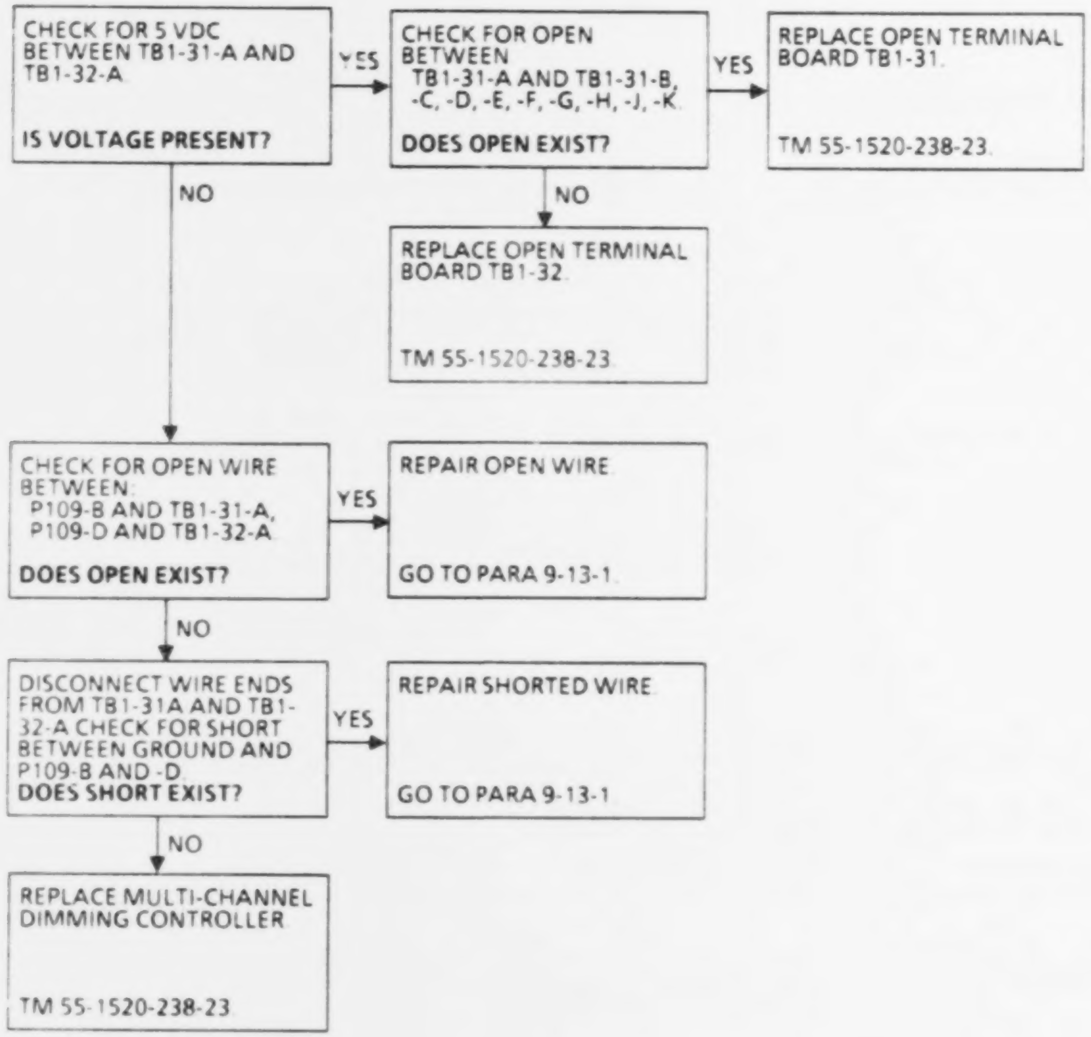
Personnel Required: (para 9-13-6)

References: (para 9-13-6)

Equipment Conditions: (para 9-13-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-31-A AND TB1-32-A. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-31-A AND TB1-31-B, -C, -D, -E, -F, -G, -H, -J, -K. DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-31. TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-32. TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-B AND TB1-31-A, P109-D AND TB1-32-A. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-31A AND TB1-32-A CHECK FOR SHORT BETWEEN GROUND AND P109-B AND -D. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23

9-13-10. ALL CH. 2 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

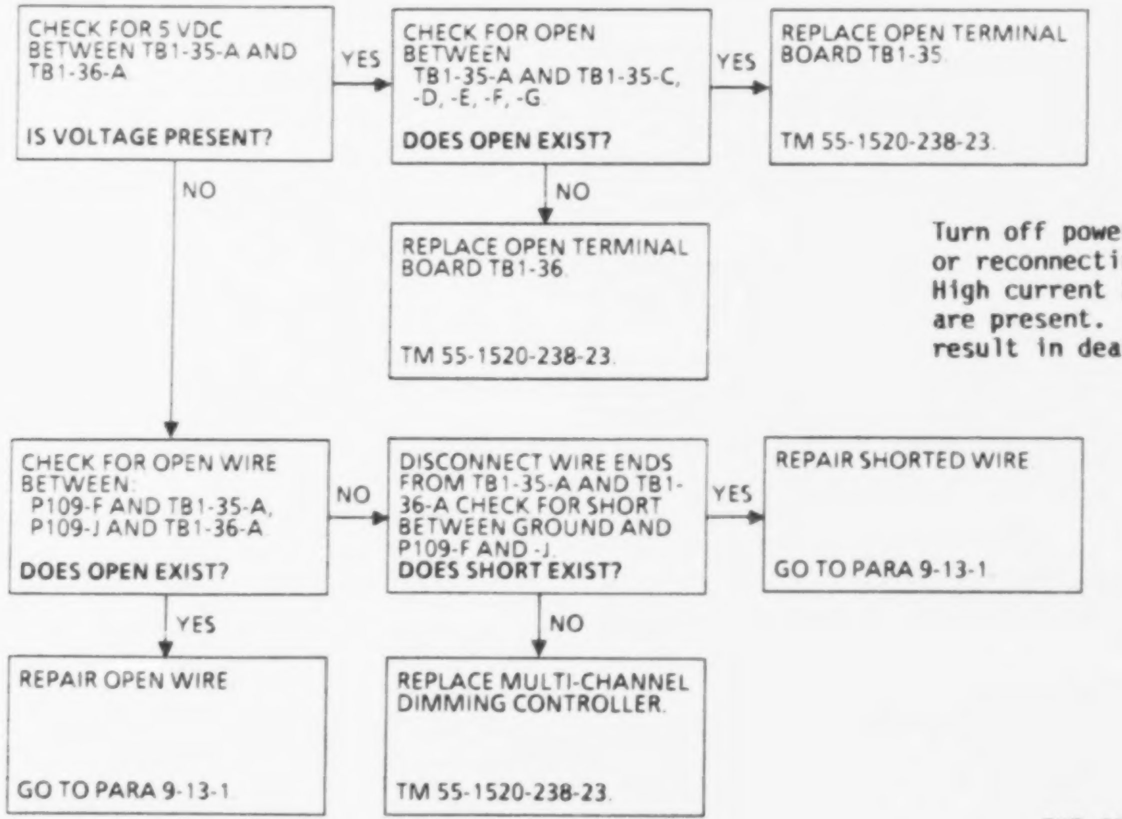
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

REFER TO VOLTAGE WARNING


CHECK FOR 5 VDC BETWEEN TB1-35-A AND TB1-36-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-35-A AND TB1-35-C, -D, -E, -F, -G.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-35.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-36.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-F AND TB1-35-A, P109-J AND TB1-36-A
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-35-A AND TB1-36-A CHECK FOR SHORT BETWEEN GROUND AND P109-F AND -J.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-13-11. ALL CH. 2 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-10)

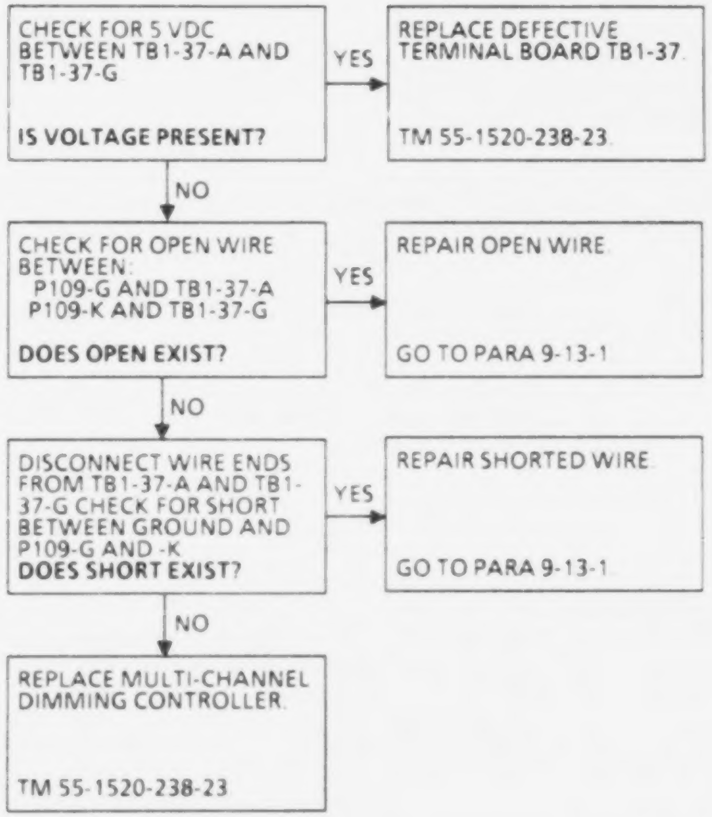
Personnel Required: (para 9-13-10)

References: (para 9-13-10)

Equipment Conditions: (para 9-13-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-37-A AND TB1-37-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-37.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-G AND TB1-37-A P109-K AND TB1-37-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-37-A AND TB1-37-G CHECK FOR SHORT BETWEEN GROUND AND P109-G AND -K.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-13-12. ALL CH. 2 NO. 3 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-10)

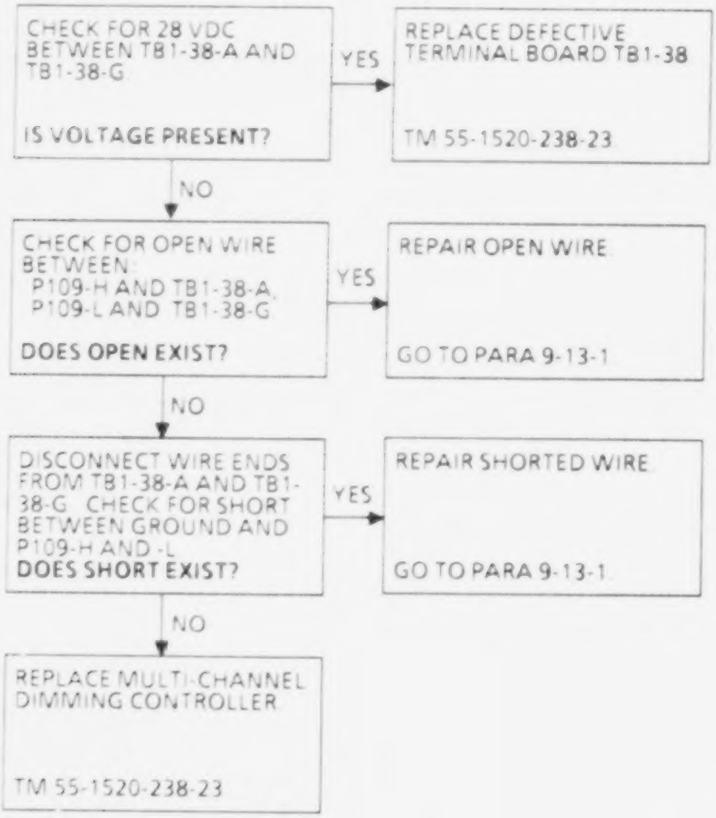
Personnel Required: (para 9-13-10)

References: (para 9-13-10)

Equipment Conditions: (para 9-13-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-38-A AND TB1-38-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-38
TM 55-1520-238-23
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-H AND TB1-38-A,
P109-L AND TB1-38-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-13-1
NO
DISCONNECT WIRE ENDS FROM TB1-38-A AND TB1-38-G. CHECK FOR SHORT BETWEEN GROUND AND P109-H AND -L
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE
GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23

END OF TASK

9-13-13. ALL CH. 3 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-10)

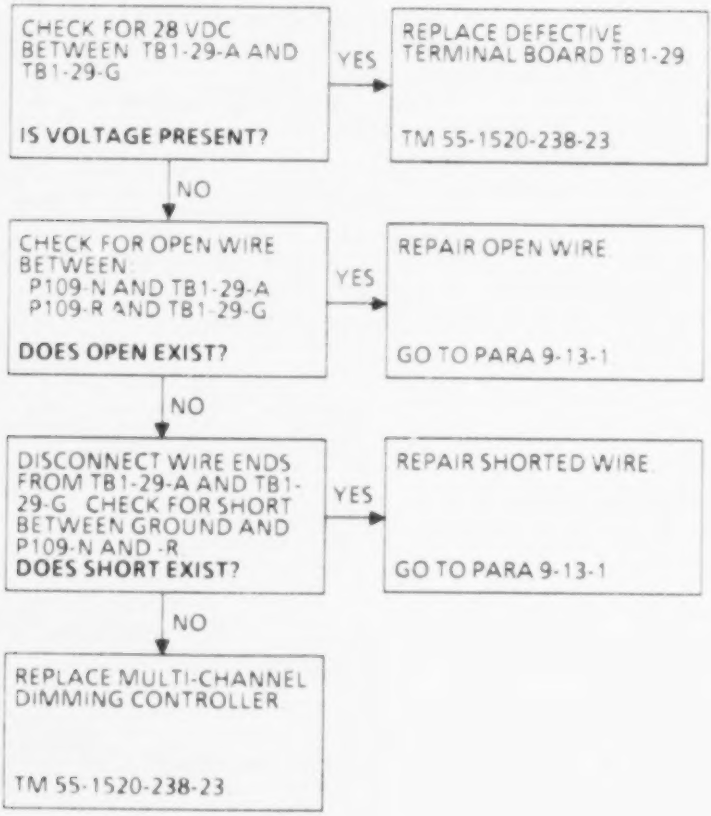
Personnel Required: (para 9-13-10)

References: (para 9-13-10)

Equipment Conditions: (para 9-13-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-29-A AND TB1-29-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-29
TM 55-1520-238-23
NO
CHECK FOR OPEN WIRE BETWEEN:
P109-N AND TB1-29-A
P109-R AND TB1-29-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-13-1
NO
DISCONNECT WIRE ENDS FROM TB1-29-A AND TB1-29-G CHECK FOR SHORT BETWEEN GROUND AND P109-N AND -R
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE
GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23

END OF TASK

9-13-14. ALL CH. 3 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

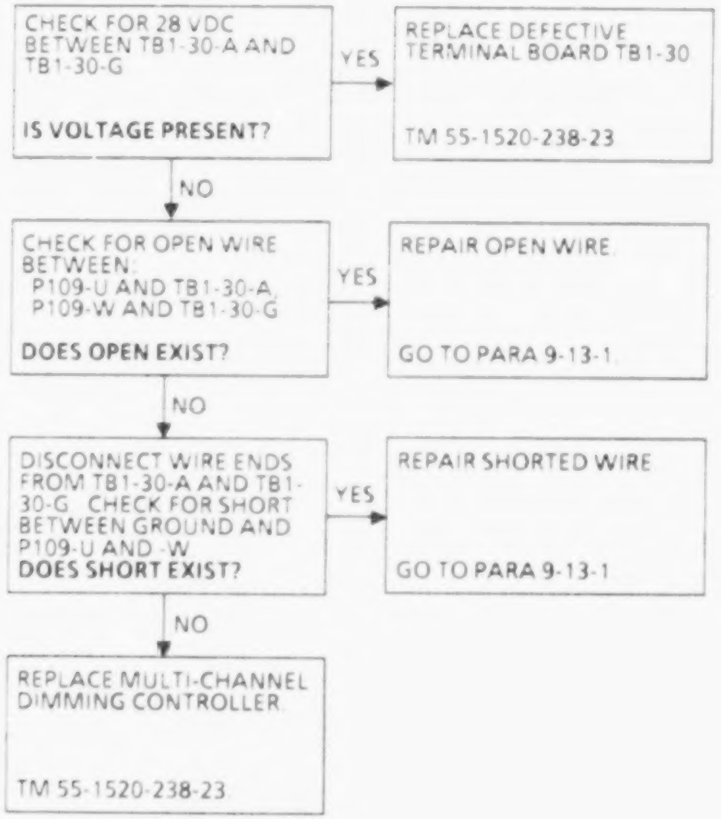
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-30-A AND TB1-30-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-30.
TM 55-1520-238-23
NO
CHECK FOR OPEN WIRE BETWEEN: P109-U AND TB1-30-A, P109-W AND TB1-30-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-30-A AND TB1-30-G. CHECK FOR SHORT BETWEEN GROUND AND P109-U AND -W.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23

END OF TASK

9-13-15. ALL CH. 3 NO. 3 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-14)

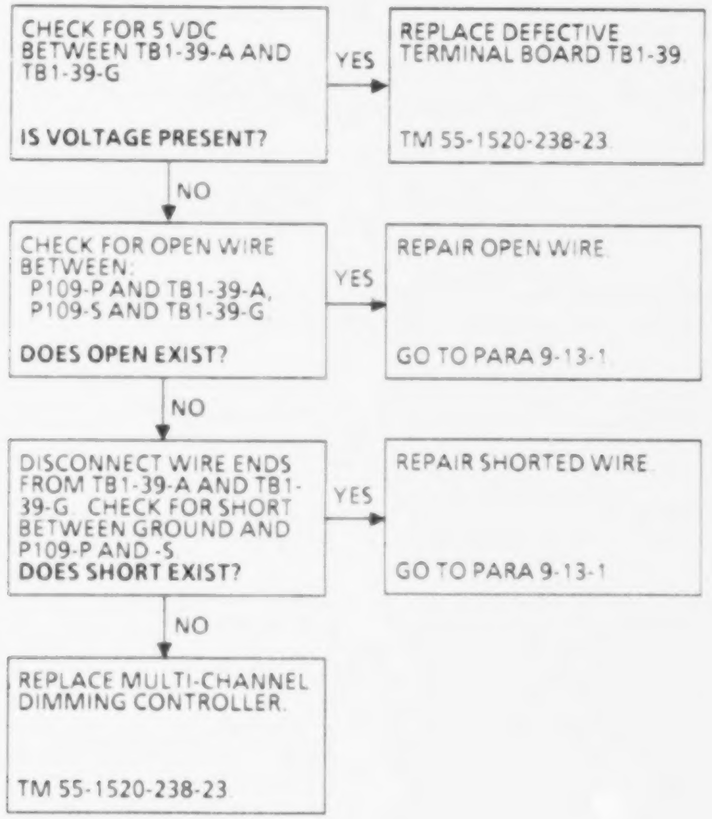
Personnel Required: (para 9-13-14)

References: (para 9-13-14)

Equipment Conditions: (para 9-13-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-39-A AND TB1-39-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-39.
TM 55-1520-238-23
NO
CHECK FOR OPEN WIRE BETWEEN: P109-P AND TB1-39-A, P109-S AND TB1-39-G.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1
NO
DISCONNECT WIRE ENDS FROM TB1-39-A AND TB1-39-G. CHECK FOR SHORT BETWEEN GROUND AND P109-P AND -S.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23

END OF TASK

9-13-16. ALL CH. 4 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-14)

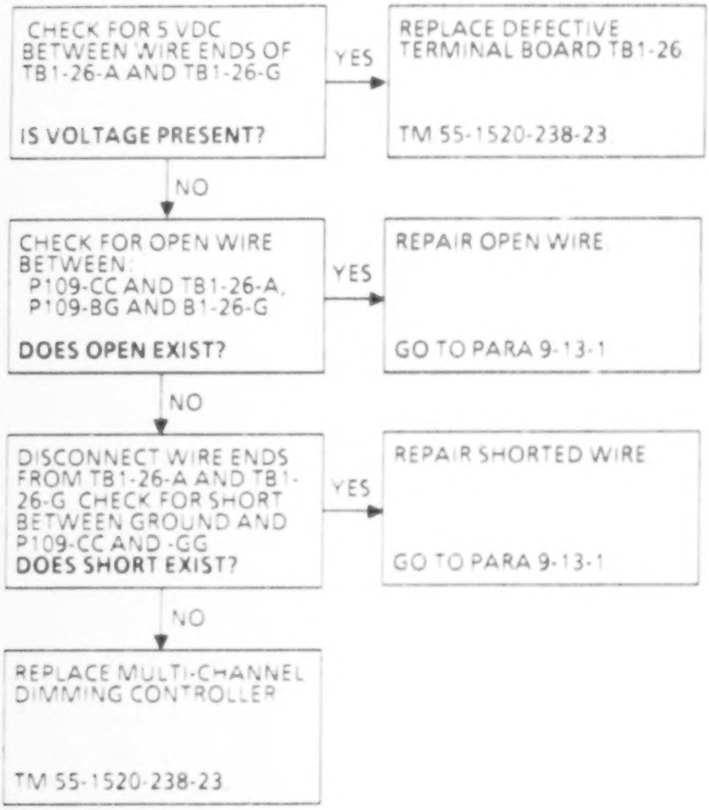
Personnel Required: (para 9-13-14)

References: (para 9-13-14)

Equipment Conditions: (para 9-13-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN WIRE ENDS OF TB1-26-A AND TB1-26-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-26
TM 55-1520-238-23
NO
CHECK FOR OPEN WIRE BETWEEN: P109-CC AND TB1-26-A, P109-BG AND B1-26-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-13-1
NO
DISCONNECT WIRE ENDS FROM TB1-26-A AND TB1-26-G. CHECK FOR SHORT BETWEEN GROUND AND P109-CC AND -GG
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE
GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23

END OF TASK

9-13-17. ALL CH. 4 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-13-14)

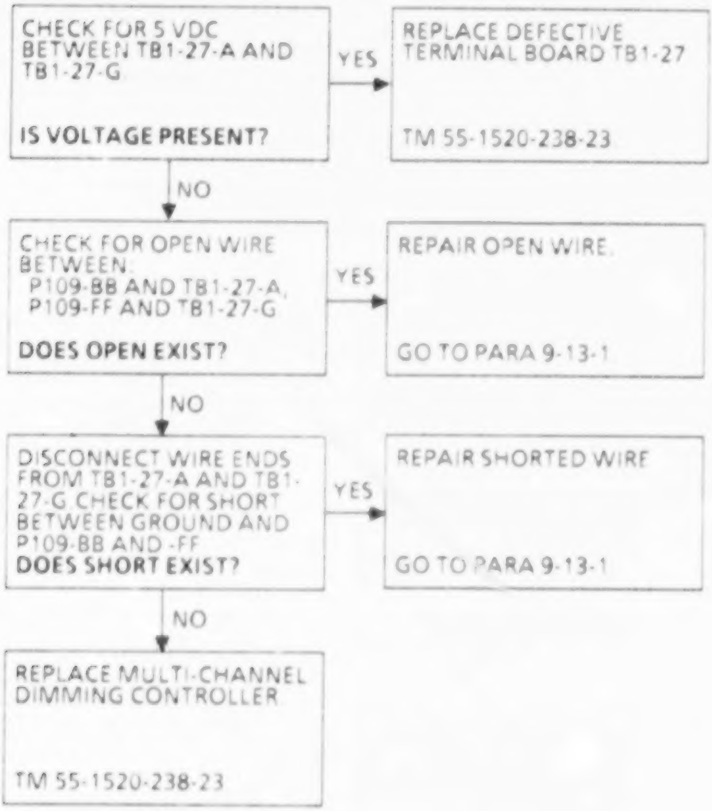
Personnel Required: (para 9-13-14)

References: (para 9-13-14)

Equipment Conditions: (para 9-13-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-27-A AND TB1-27-G
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-27
TM 55-1520-238-23
NO
CHECK FOR OPEN WIRE BETWEEN: P109-BB AND TB1-27-A, P109-FF AND TB1-27-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-13-1
NO
DISCONNECT WIRE ENDS FROM TB1-27-A AND TB1-27-G. CHECK FOR SHORT BETWEEN GROUND AND P109-BB AND -FF
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE
GO TO PARA 9-13-1
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23

END OF TASK

9-13-18. ALL CH. 4 NO. 4 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

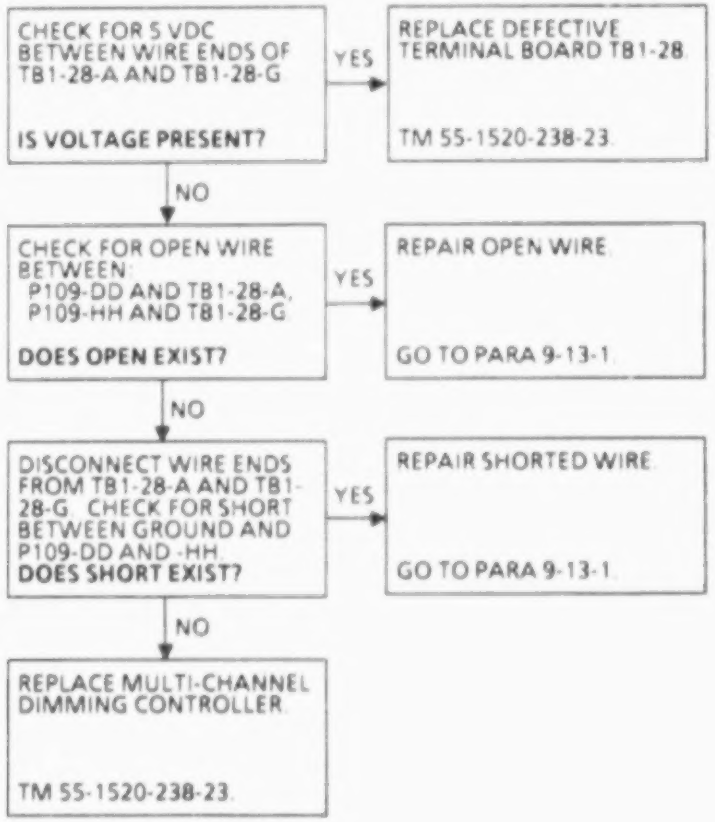
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN WIRE ENDS OF TB1-28-A AND TB1-28-G. IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-28. TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: P109-DD AND TB1-28-A, P109-HH AND TB1-28-G. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-13-1.
NO
DISCONNECT WIRE ENDS FROM TB1-28-A AND TB1-28-G. CHECK FOR SHORT BETWEEN GROUND AND P109-DD AND -HH. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-13-19. EXT LT/INTR LT EDGE-LIGHT - DOES NOT LIGHT

Tools: (para 9-13-18)

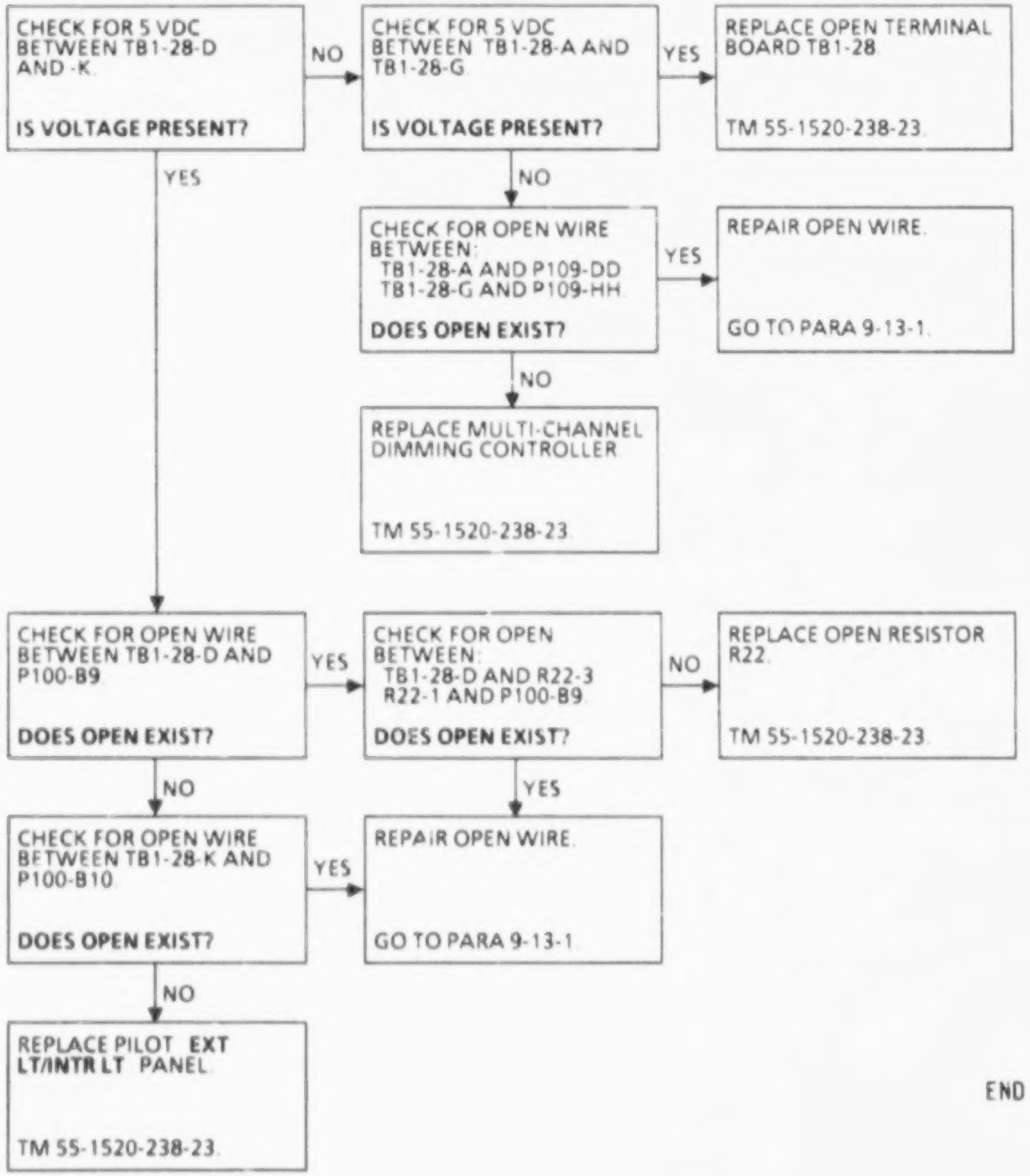
Personnel Required: (para 9-13-18)

References: (para 9-13-18)

Equipment Conditions: (para 9-13-18)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-28-D AND -K. IS VOLTAGE PRESENT?
NO
CHECK FOR 5 VDC BETWEEN TB1-28-A AND TB1-28-G. IS VOLTAGE PRESENT?
YES
REPLACE OPEN TERMINAL BOARD TB1-28. TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: TB1-28-A AND P109-DD TB1-28-G AND P109-HH. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.
YES
CHECK FOR OPEN WIRE BETWEEN TB1-28-D AND P100-B9. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN: TB1-28-D AND R22-3 R22-1 AND P100-B9. DOES OPEN EXIST?
NO
REPLACE OPEN RESISTOR R22. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-13-1.
NO
CHECK FOR OPEN WIRE BETWEEN TB1-28-K AND P100-B10. DOES OPEN EXIST?
YES
NO
REPLACE PILOT EXT LT/INTR LT PANEL. TM 55-1520-238-23.

END OF TASK

9-13-20. ALL PILOT EDGE-LIGHTS - ARE NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician
	One person to assist

References:

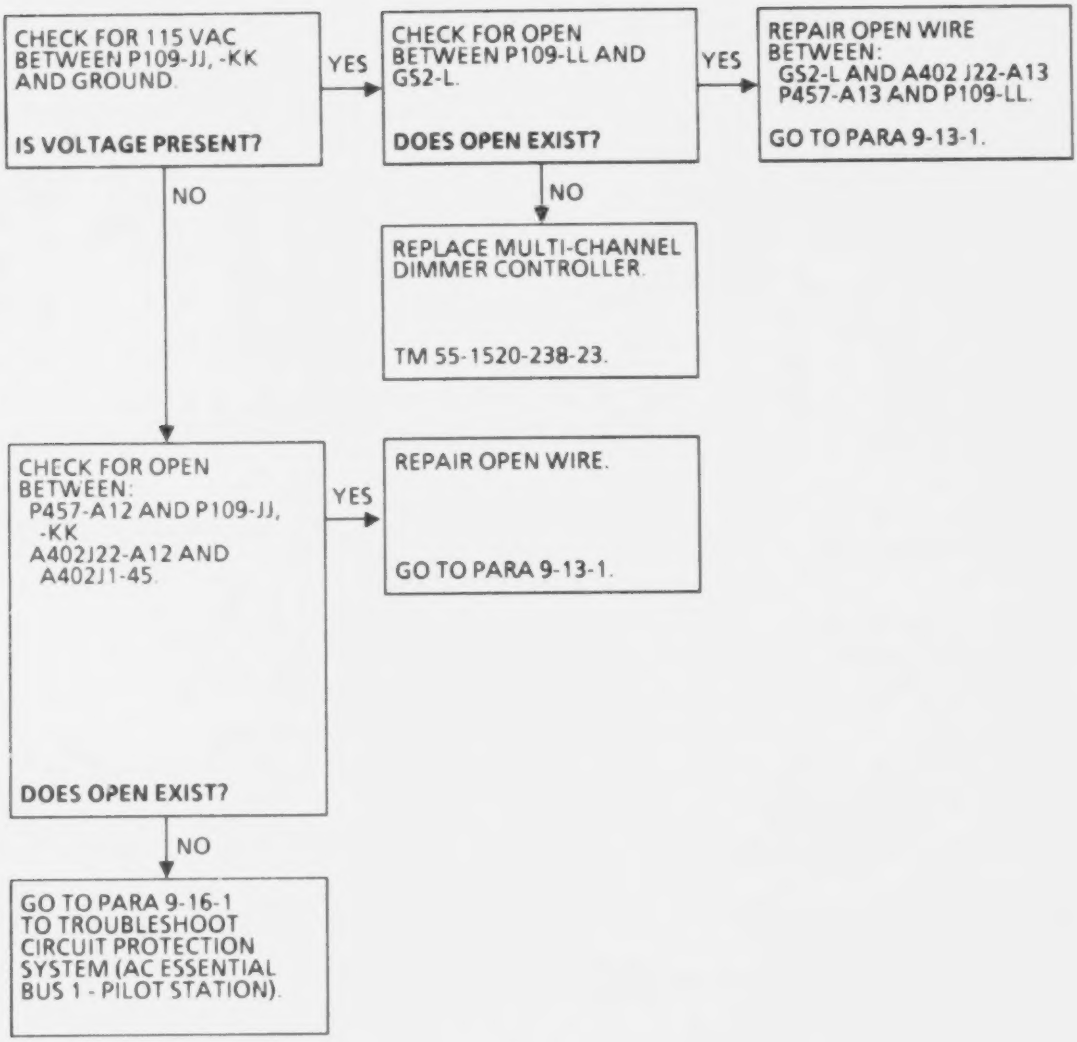
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 115 VAC BETWEEN P109-JJ, -KK AND GROUND. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN P109-LL AND GS2-L. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN: GS2-L AND A402 J22-A13 P457-A13 AND P109-LL. GO TO PARA 9-13-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROLLER. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: P457-A12 AND P109-JJ, -KK A402J22-A12 AND A402J1-45. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-13-1.
NO
GO TO PARA 9-16-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION).

END OF TASK

9-14-1. CPG EDGE-LIGHT - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

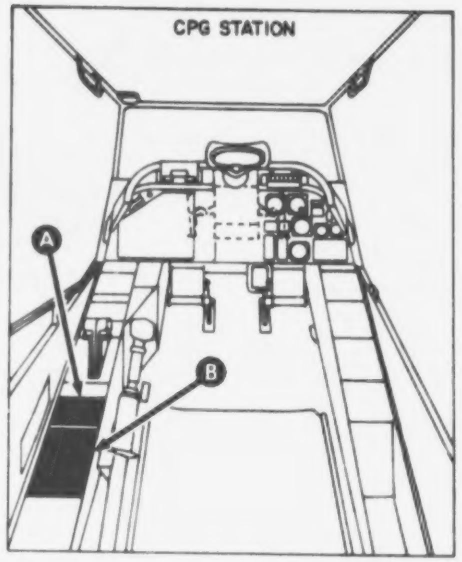
TM 55-1520-238-23

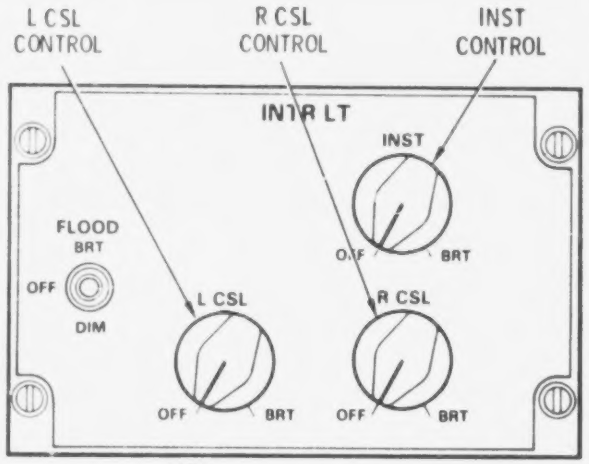
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

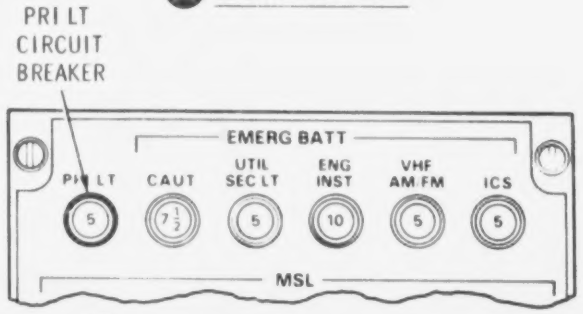
A. Perform operational check as follows:

TASK	RESULT
1. On CPG circuit breaker panel, check that **PRI LT** circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-14-4.
1.1. On CPG **INTR LT** panel, set **L CSL**, **R CSL**, and **INST** to **BRT**.	
1.2. On CPG instrument panel, left console and right console, check that all edge-lights are lighted.	If any CPG edge-lights are not lighted, go to step 2. If all CPG edge-lights are lighted, go to step 5. If all CPG edge-lights are not lighted, go to para 9-14-17.
2. On CPG **INTR LT** panel, check that all edge-lights controlled by **L CSL** are lighted.	If all CPG left console edge-lights are not lighted, go to para 9-14-5.
3. On CPG **INTR LT** panel, check that all edge-lights controlled by **R CSL** are lighted.	If all CPG right console edge-lights are not lighted, go to para 9-14-6.
4. On CPG **INTR LT** panel, check that all edge-lights controlled by **INST** are lighted.	If all CPG instrument panel edge-lights are not lighted, go to para 9-14-7.

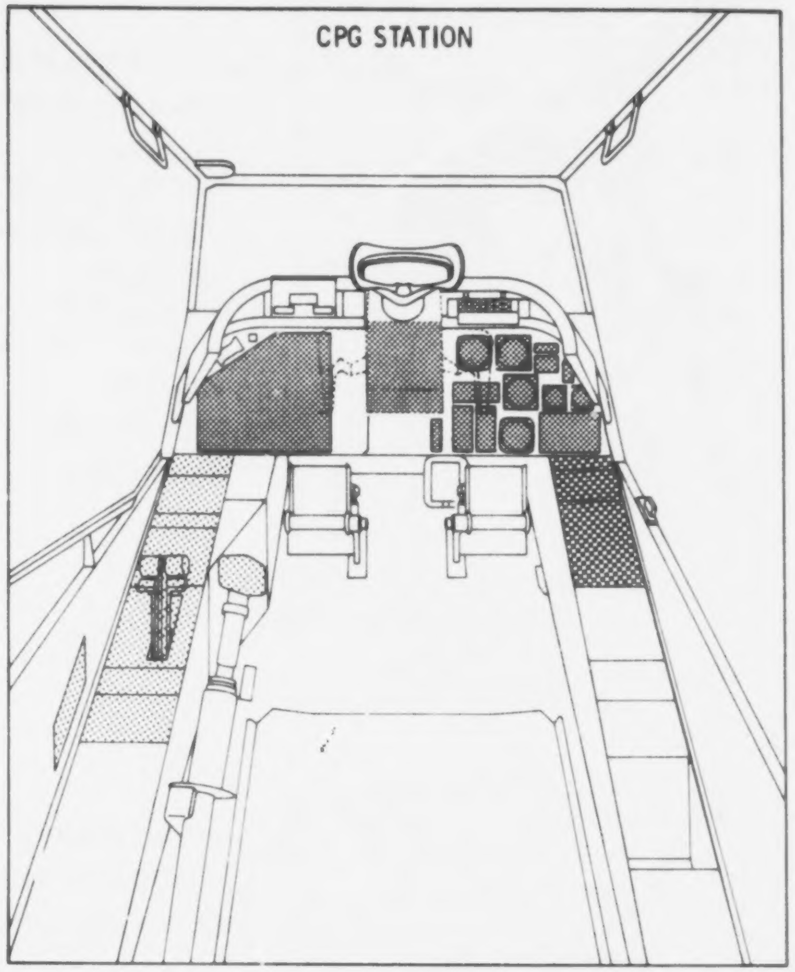




Ⓐ CPG INTR LT PANEL



Ⓑ CPG CIRCUIT BREAKER PANEL NO. 1



░ EDGE LIGHTS CONTROLLED BY L CSL CONTROL

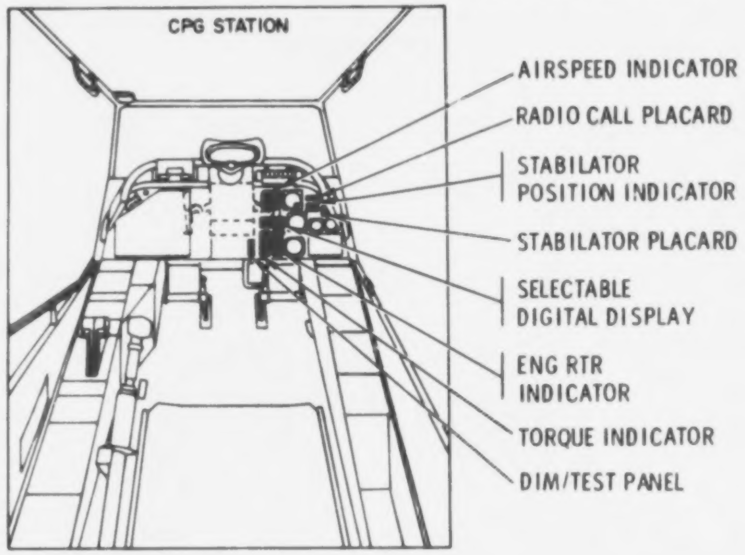
▒ EDGE LIGHTS CONTROLLED BY INST CONTROL

▓ EDGE LIGHTS CONTROLLED BY R CSL CONTROL

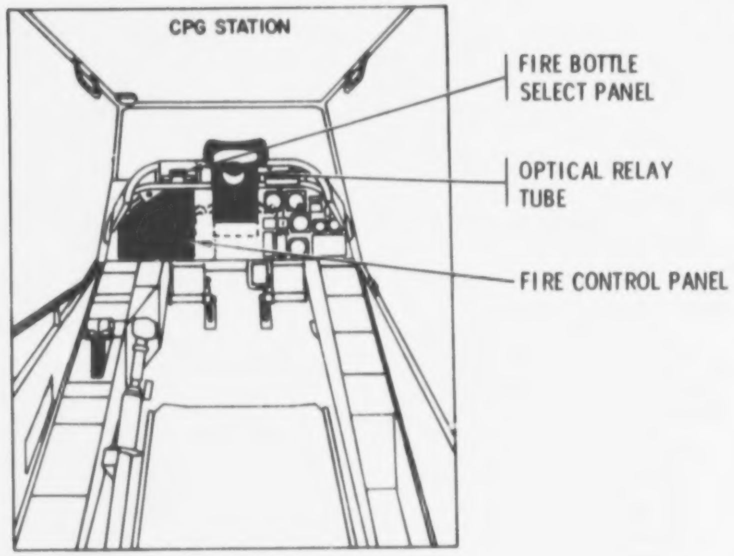
MM04/1-1028-1B

GO TO NEXT PAGE

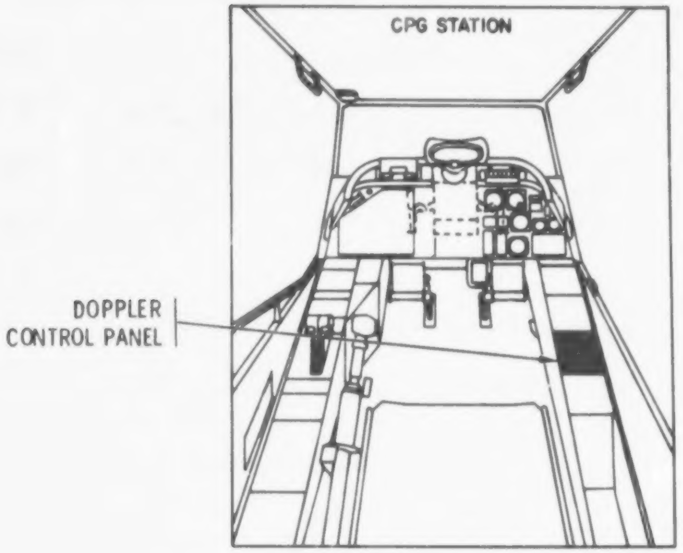
9-14-1. CPG EDGE-LIGHT - OPERATIONAL CHECK (cont)



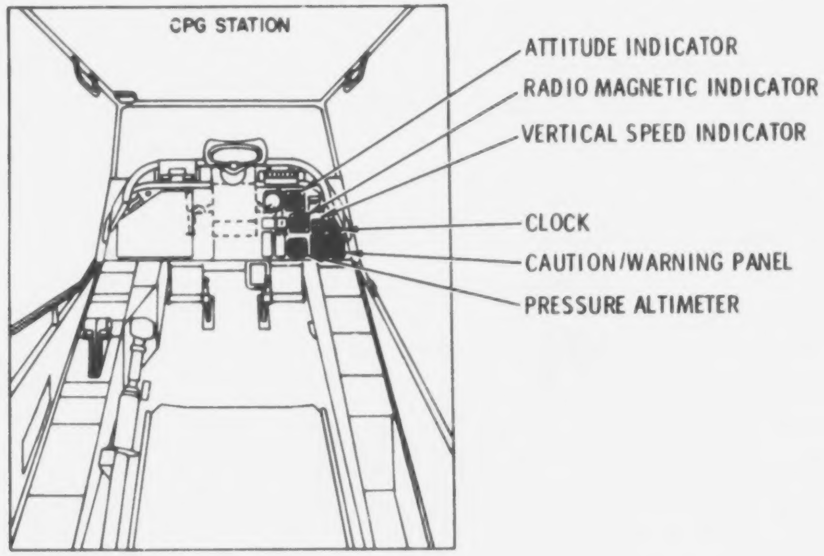
CH. 1 NO. 1



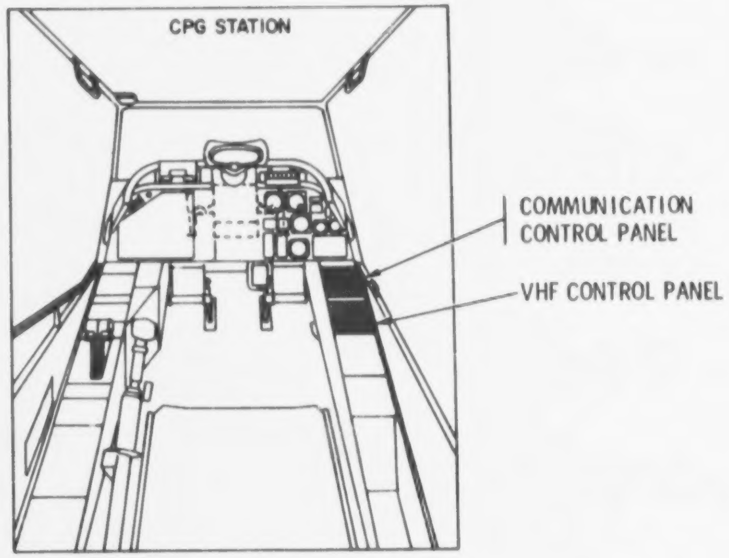
CH. 2 NO. 1



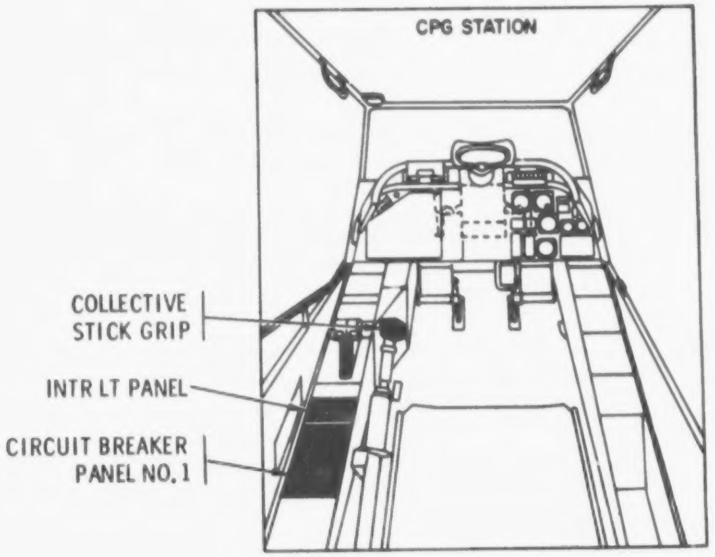
CH. 3 NO. 2



CH. 1 NO. 2



CH. 3 NO. 1

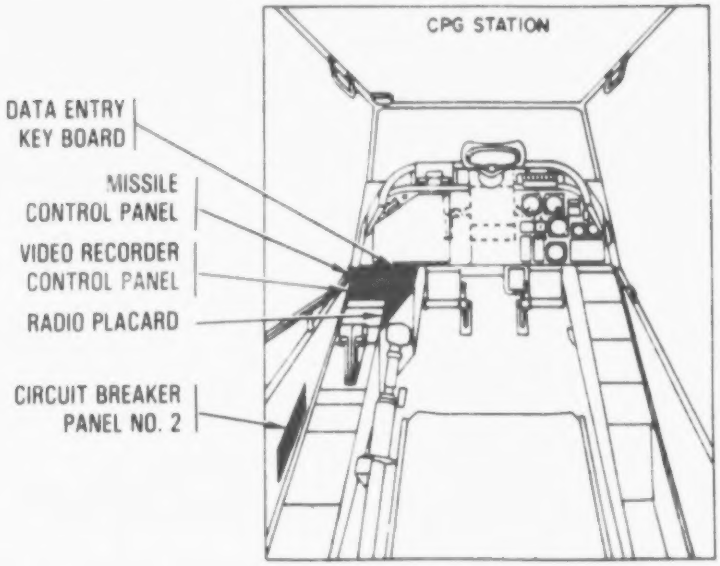


CH. 4 NO. 3

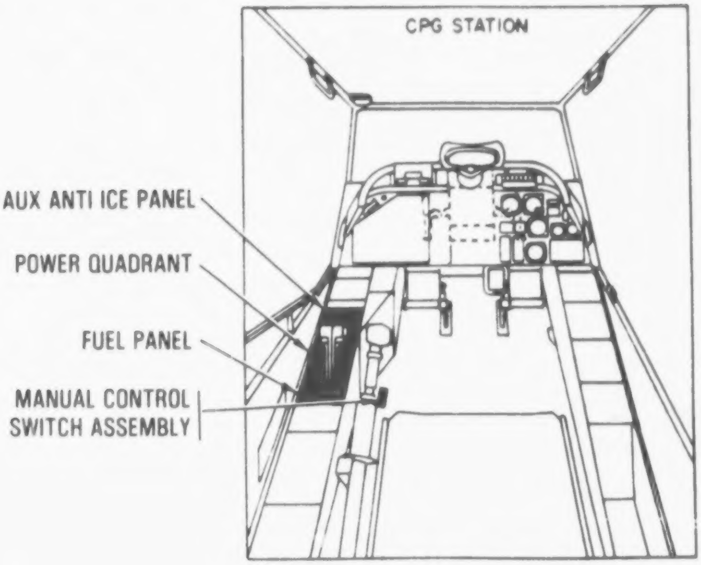
MM04/1-1028-2B

GO TO NEXT PAGE

9-14-1. CPG EDGE-LIGHT - OPERATIONAL CHECK (cont)



CH. 4 NO. 1



CH. 4 NO. 2

MM04/1-1028-3

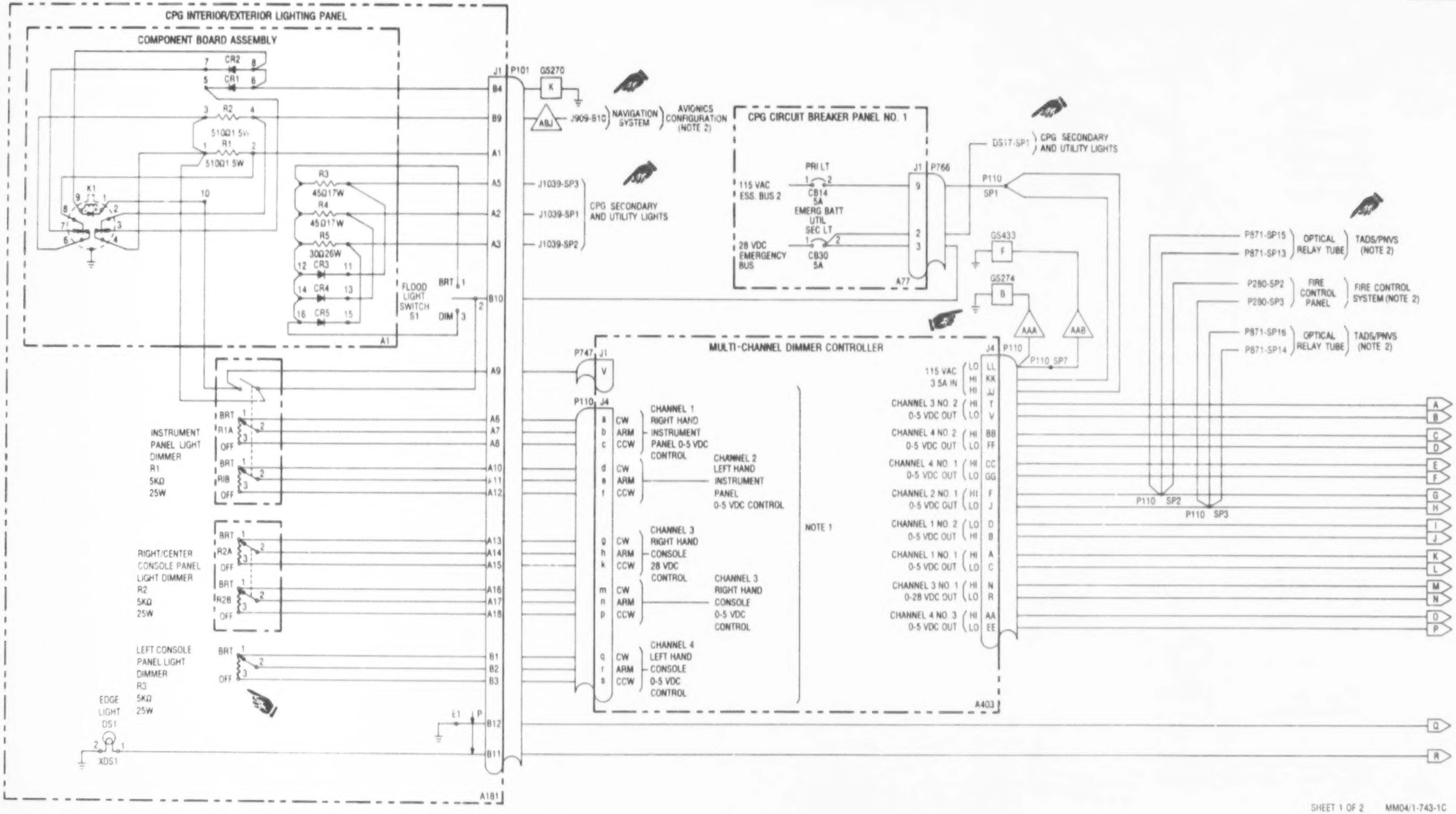
TASK	RESULT
5. Check that **INTR LT** edge-light panel is lighted.	If **INTR LT** edge-light panel is not lighted, go to para 9-14-16.
6. Check that all CH. 1, No. indicator edge-lights are lighted.	If all CH. 1, No. 1 indicators are not lighted, go to para 9-14-8.
7. Check that all CH. 1, No. 2 indicators are lighted.	If all CH. 1, No. 2 indicators are not lighted, go to para 9-14-9.
8. Check that all CH. 2, No. 1 indicators are lighted.	If all CH. 2, No. 1 indicators are not lighted, go to para 9-14-10.
9. Rotate **INST** control to **OFF**. Check that all Ch. 3, No. 1 control panel edge-lights are lighted.	If all CH. 3, No. 1 control panels are not lighted, go to para 9-14-11.
10. Check that all CH. 3, No. 2 control panels are lighted.	If all CH. 3, No. 2 control panels are not lighted, go to para 9-14-12.
11. Rotate **R CSL** control to **OFF**. Check that all Ch. 4, No. 1 control panel edge-lights are lighted.	If all CH. 4, No. 1 control panels are not lighted, go to para 9-14-13.
12. Check that all CH. 4, No. 2 control panels are lighted.	If all CH. 4, No. 2 control panels are not lighted, go to para 9-14-14.
13. Check that all CH. 4, No. 3 control panels are lighted.	If all CH. 4, No. 4 control panels are not lighted, go to para 9-14-15.

B. On CPG **INTR LT** panel, set **L CSL** control to **OFF**.

C. Remove External Power-Electrical (TM 55-1520-238-23).

END OF TASK

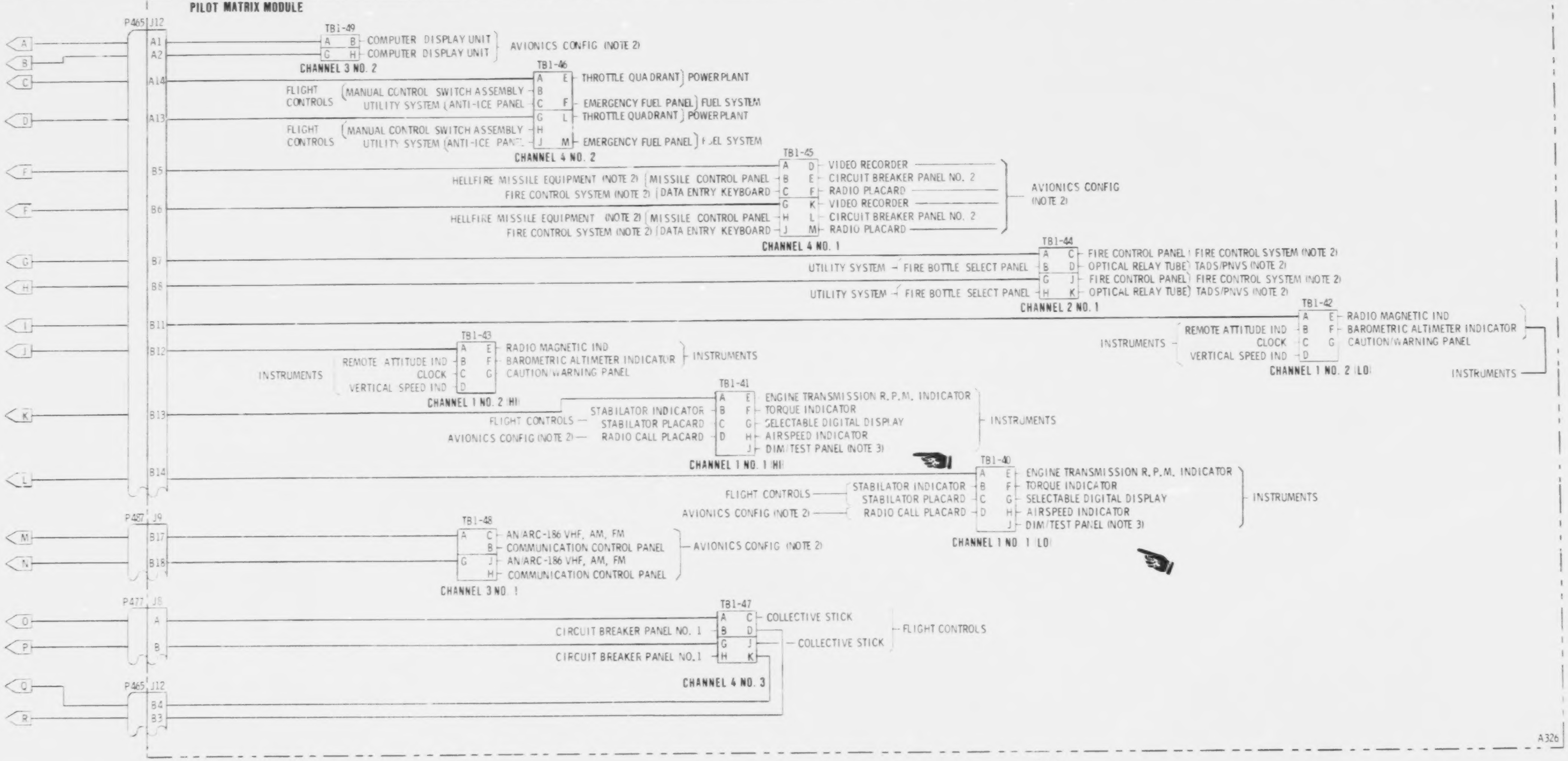
9-14-2. CPG EDGE-LIGHT - INTERCONNECTION DIAGRAM



CPG INTERIOR/EXTERIOR LIGHTING PANEL
COMPONENT BOARD ASSEMBLY
CR2
CR1
R2
510Ω1 5W
R1
510Ω1 5W
K1
R3
45Ω17W
R4
45Ω17W
R5
30Ω26W
CR3
CR4
CR5
FLOOD LIGHT SWITCH S1
BRT
DIM
A1
J1
P101
GS270
K
B4
B9
A1
A5
A2
A3
B10
A9
A6
A7
A8
A10
A11
A12
A13
A14
A15
A16
A17
A18
B1
B2
B3
B12
B11
A181
ABJ
J909-B10
NAVIGATION SYSTEM
AVIONICS CONFIGURATION (NOTE 2)
J1039-SP3
J1039-SP1
J1039-SP2
CPG SECONDARY AND UTILITY LIGHTS
CPG CIRCUIT BREAKER PANEL NO. 1
115 VAC ESS. BUS 2
PRI LT
CB14 5A
EMERG BATT UTIL SEC LT
28 VDC EMERGENCY BUS
CB30 5A
J1
P766
A77
DS17-SP1
CPG SECONDARY AND UTILITY LIGHTS
P110 SP1
GS433
F
GS274
B
AAA
AAB
P871-SP15
P871-SP13
OPTICAL RELAY TUBE
TADS/PNVS (NOTE 2)
P280-SP2
P280-SP3
FIRE CONTROL PANEL
FIRE CONTROL SYSTEM (NOTE 2)
P871-SP16
P871-SP14
OPTICAL RELAY TUBE
TADS/PNVS (NOTE 2)
INSTRUMENT PANEL LIGHT DIMMER R1 5KΩ 25W
BRT
R1A
OFF
BRT
R1B
OFF
RIGHT/CENTER CONSOLE PANEL LIGHT DIMMER R2 5KΩ 25W
BRT
R2A
OFF
BRT
R2B
OFF
LEFT CONSOLE PANEL LIGHT DIMMER R3 5KΩ 25W
BRT
OFF
EDGE LIGHT DS1
XDS1
E1
P
P747 J1
V
P110 J4
MULTI-CHANNEL DIMMER CONTROLLER
CW ARM CCW
CHANNEL 1 RIGHT HAND INSTRUMENT PANEL 0-5 VDC CONTROL
CHANNEL 2 LEFT HAND INSTRUMENT PANEL 0-5 VDC CONTROL
CHANNEL 3 RIGHT HAND CONSOLE 28 VDC CONTROL
CHANNEL 3 RIGHT HAND CONSOLE 0-5 VDC CONTROL
CHANNEL 4 LEFT HAND CONSOLE 0-5 VDC CONTROL
NOTE 1
J4
P110
115 VAC 3.5A IN
LO LL
HI KK
HI JJ
CHANNEL 3 NO. 2 0-5 VDC OUT HI T LO V
CHANNEL 4 NO. 2 0-5 VDC OUT HI BB LO FF
CHANNEL 4 NO. 1 0-5 VDC OUT HI CC LO GG
CHANNEL 2 NO. 1 0-5 VDC OUT HI F LO J
CHANNEL 1 NO. 2 0-5 VDC OUT LO D HI B
CHANNEL 1 NO. 1 0-5 VDC OUT HI A LO C
CHANNEL 3 NO. 1 0-28 VDC OUT HI N LO R
CHANNEL 4 NO. 3 0-5 VDC OUT HI AA LO EE
A403
P110 SP7
P110 SP2
P110 SP3
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R

SHEET 1 OF 2 MM04/1-743-1C

9-14-2. CPG EDGE-LIGHT - INTERCONNECTION DIAGRAM (cont)



NOTES:

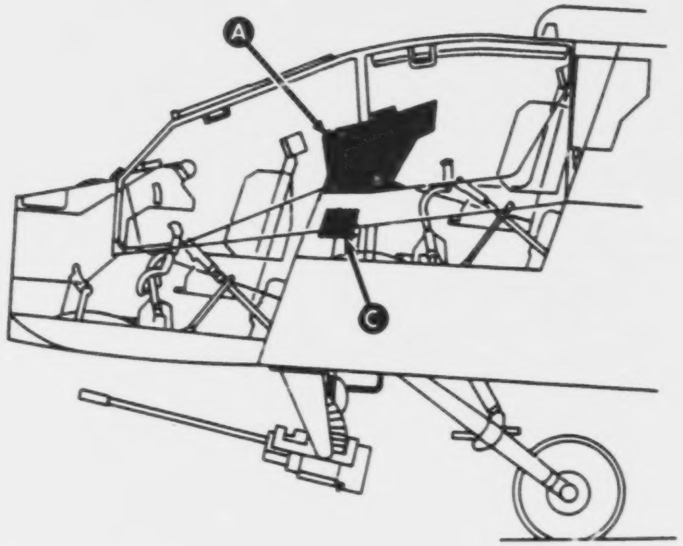
1. CW - +28 VDC OUT
   ARM - 0 TO +28 VDC IN
   CCW - +28 VDC RETURN
2. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
3. FOR HELICOPTERS WITH CPG DIM/TEST PANEL INSTALLED.

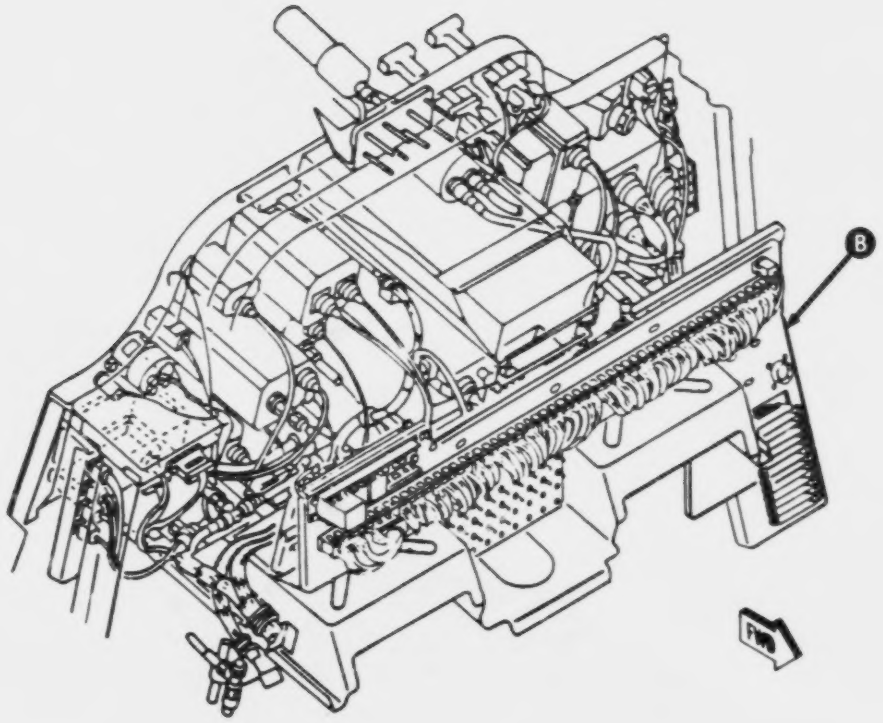
MM04/1-743-2B

best copy available

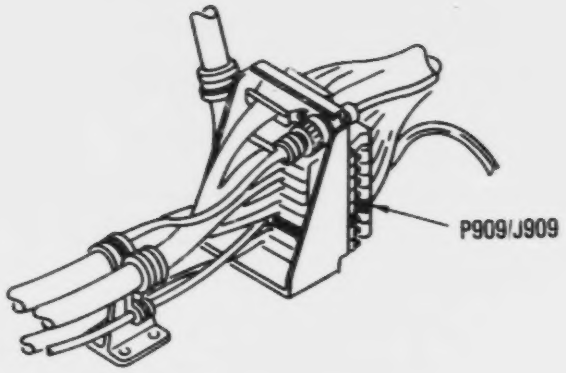
Reproduced from poor document.

9-14-3. CPG EDGE-LIGHT PANEL- ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

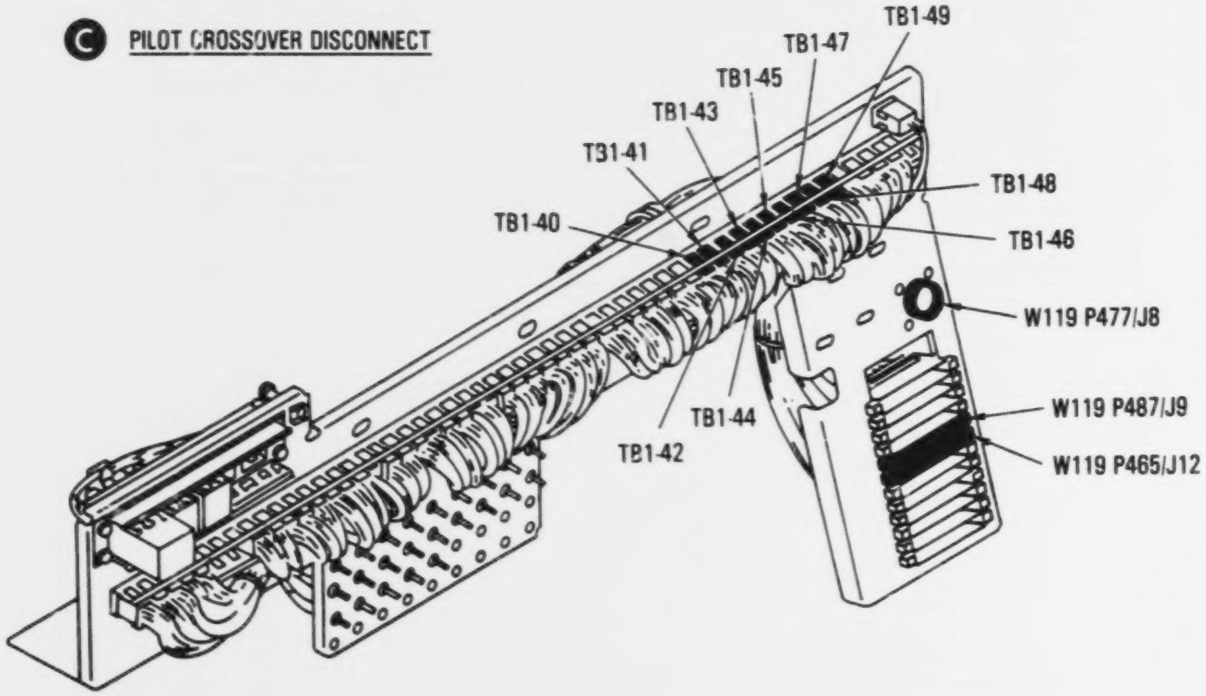




Ⓐ PILOT INSTRUMENT PANEL



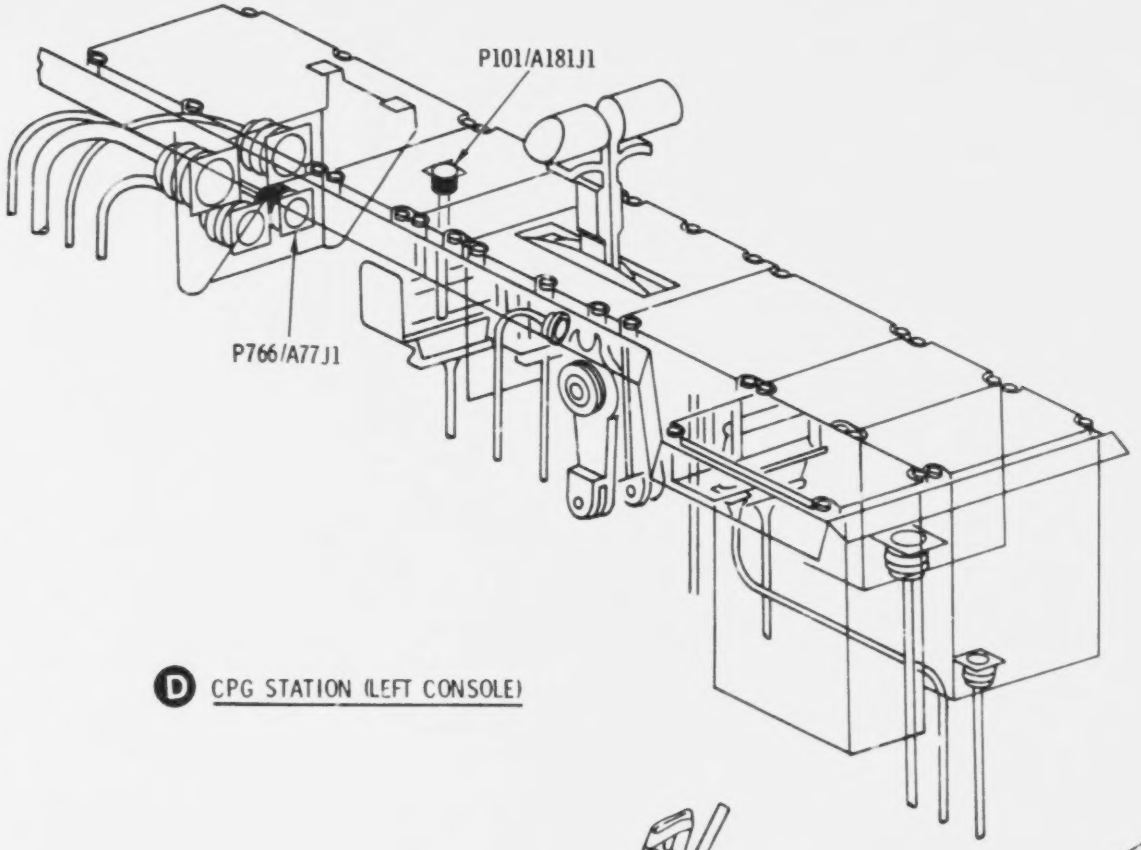
Ⓒ PILOT CROSSOVER DISCONNECT



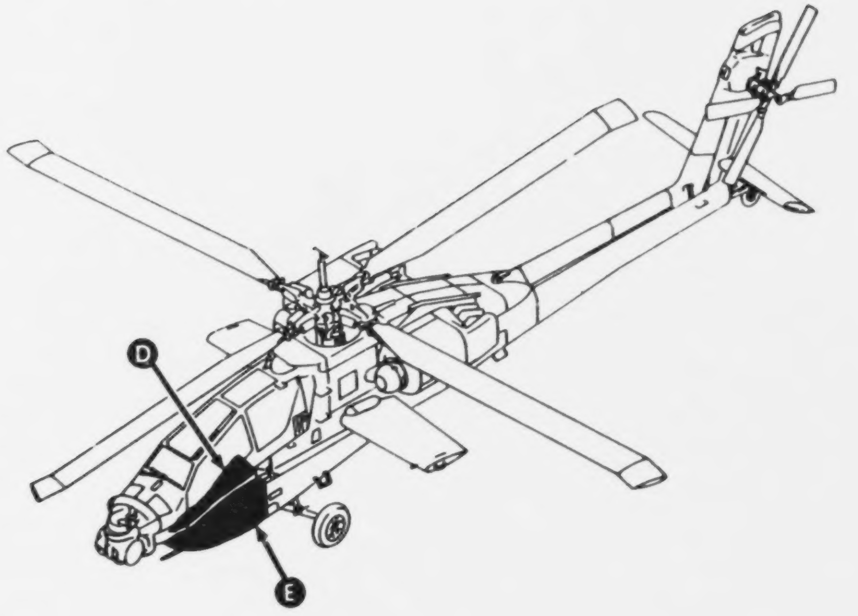
Ⓑ PILOT MATRIX MODULE

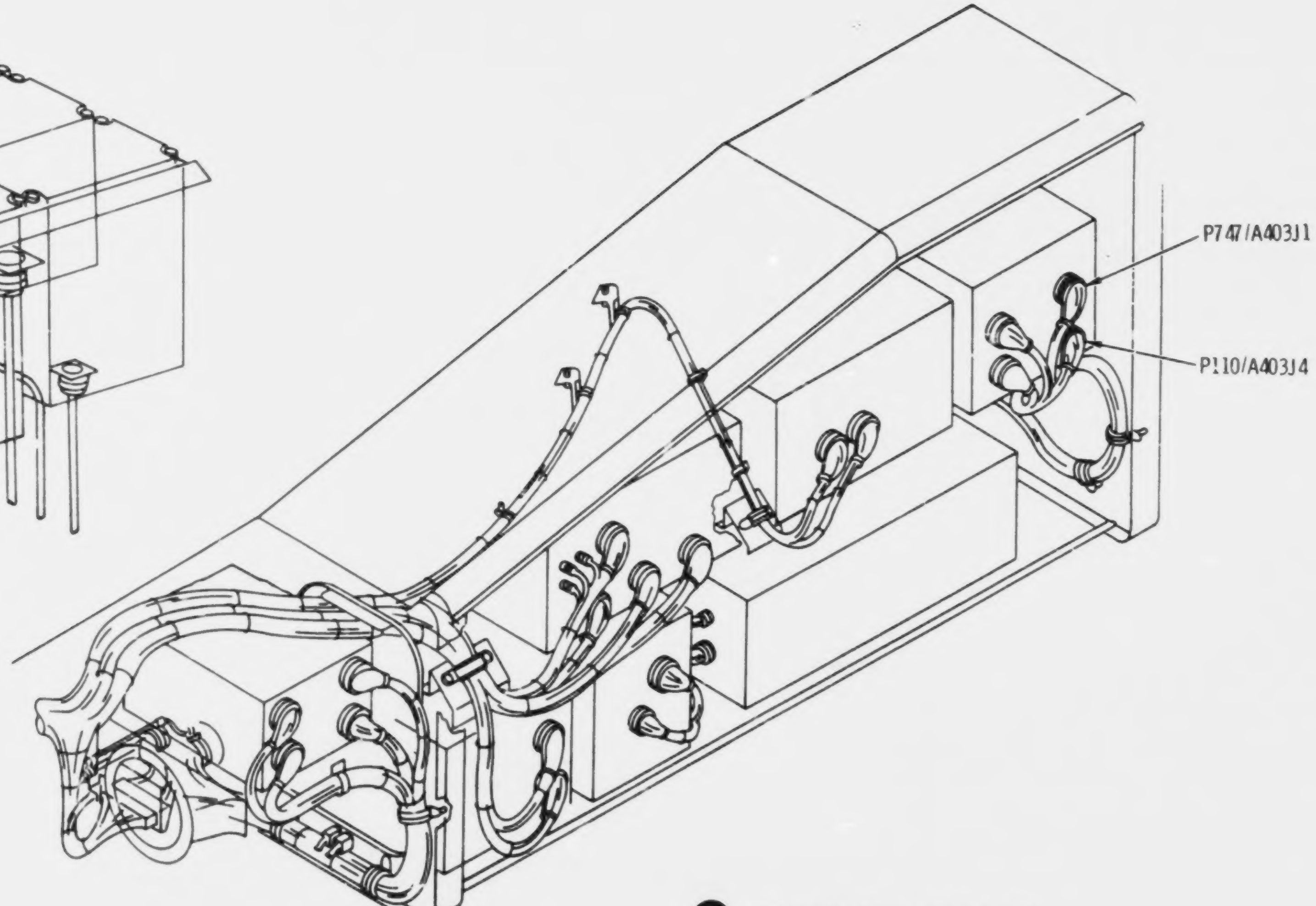
MM04/1-1288-1

9-14-3. CPG EDGE-LIGHT PANEL- ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



D CPG STATION (LEFT CONSOLE)





E LEFT FORWARD AVIONICS BAY

MM04/1-1288-2A

9-14-4. CPU PRI LT CIRCUIT BREAKER (CB14) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician

References:

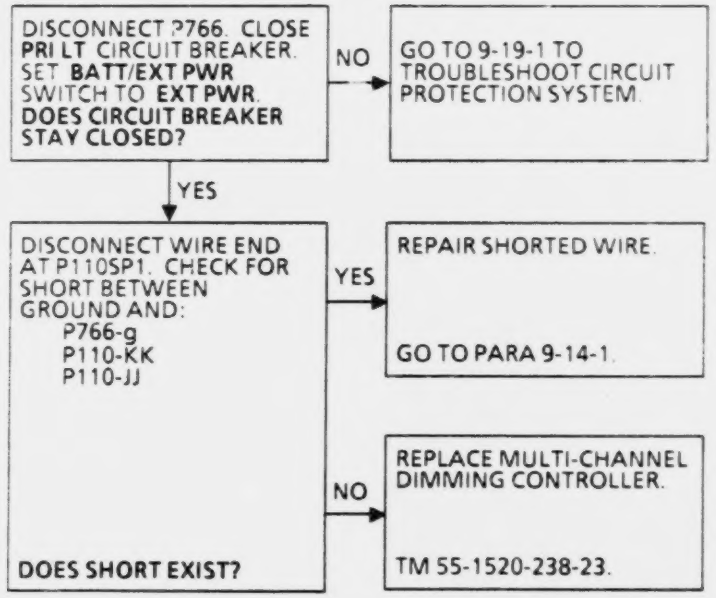
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P766. CLOSE **PRI LT** CIRCUIT BREAKER. SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES CIRCUIT BREAKER STAY CLOSED?**

NO: GO TO 9-19-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

YES: DISCONNECT WIRE END AT P110SP1. CHECK FOR SHORT BETWEEN GROUND AND:
P766-g
P110-KK
P110-JJ
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-14-1.

NO: REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-14-5. ALL CPG LEFT CONSOLE EDGE-LIGHTED PANELS - DOES NOT LIGHT

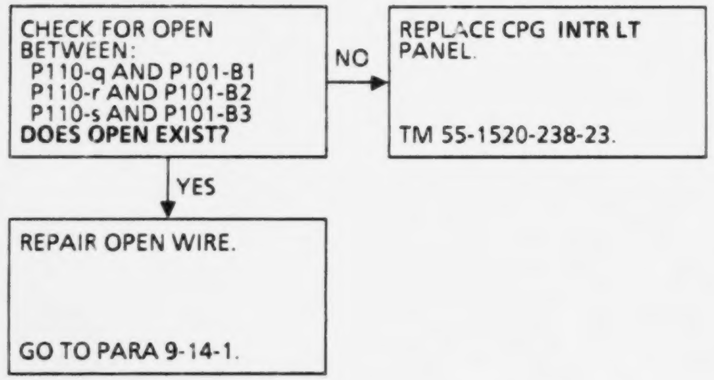
Tools: (para 9-14-4)

Personnel Required: (para 9-14-4)

References: (para 9-14-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - L90 door opened



CHECK FOR OPEN BETWEEN:
P110-q AND P101-B1
P110-r AND P101-B2
P110-s AND P101-B3
DOES OPEN EXIST?

NO: REPLACE CPG **INTR LT** PANEL. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-14-1.

END OF TASK

9-14-6. ALL CPG RIGHT CONSOLE EDGE-LIGHTED PANELS - DO NOT LIGHT

Tools: (para 9-14-4)

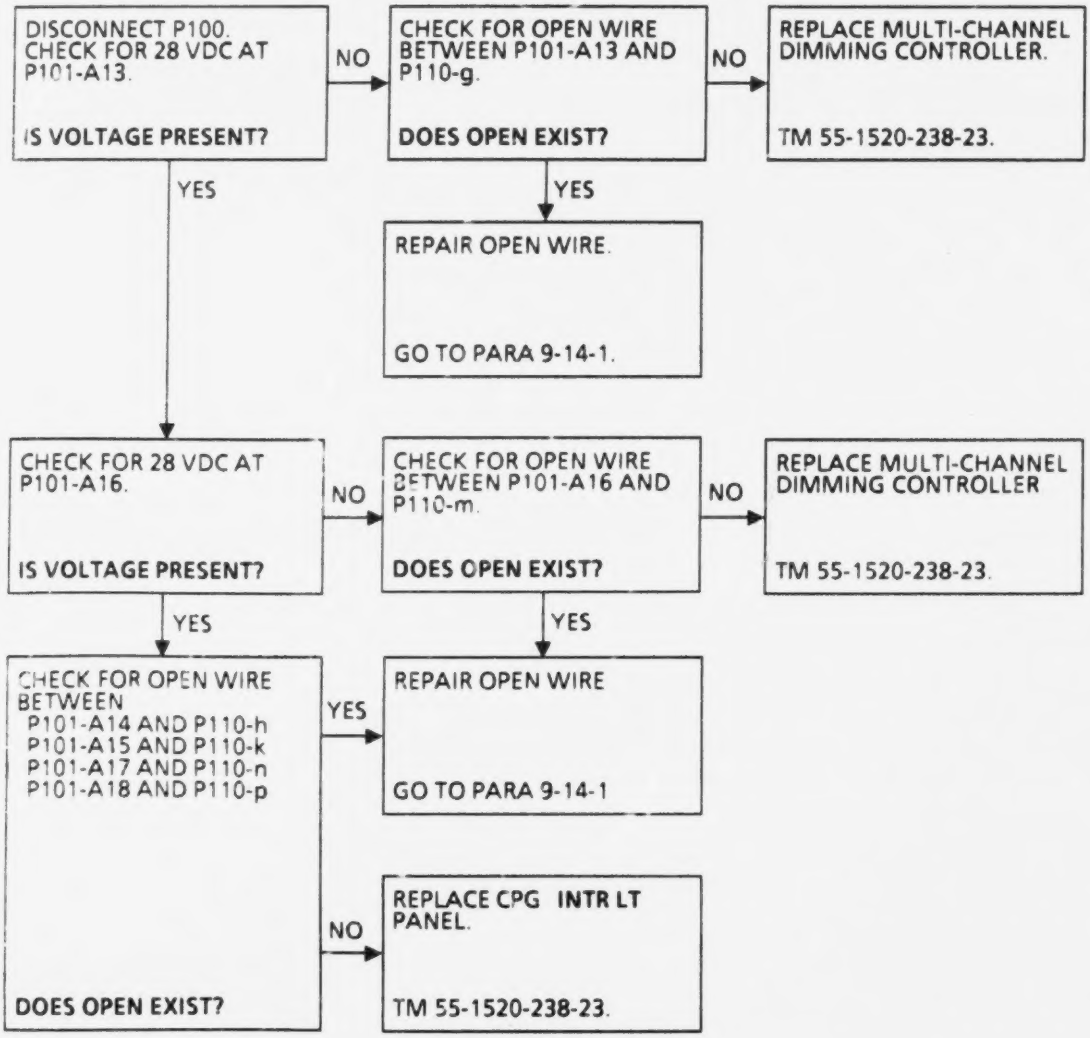
Personnel Required: (para 9-14-4)

References: (para 9-14-4)

Equipment Conditions: (para 9-14-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-14-7. ALL CPG INSTRUMENT EDGE-LIGHTED PANELS - DO NOT LIGHT

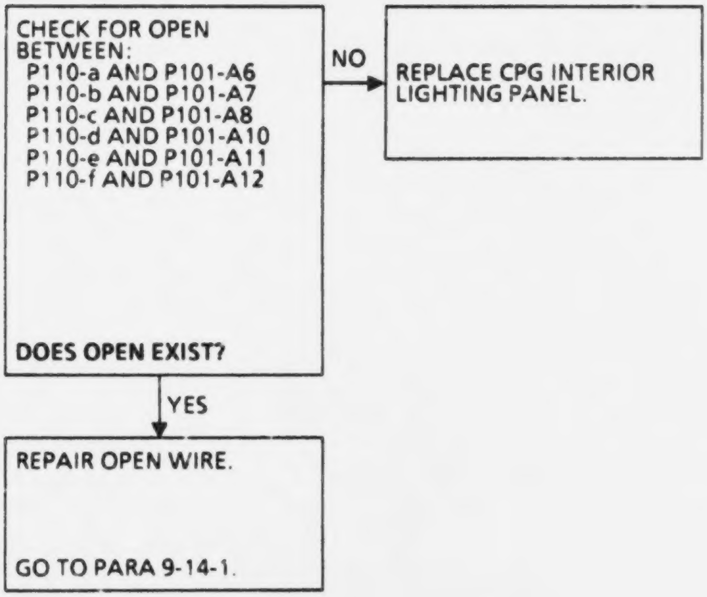
9-14-6/9-14-7

Tools: (para 9-14-4)

Personnel Required: (para 9-14-4)

References: (para 9-14-4)

Equipment Conditions: (para 9-14-5)



END OF TASK

9-14-8. ALL CH. 1 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

References:

TM 55-1520-238-23

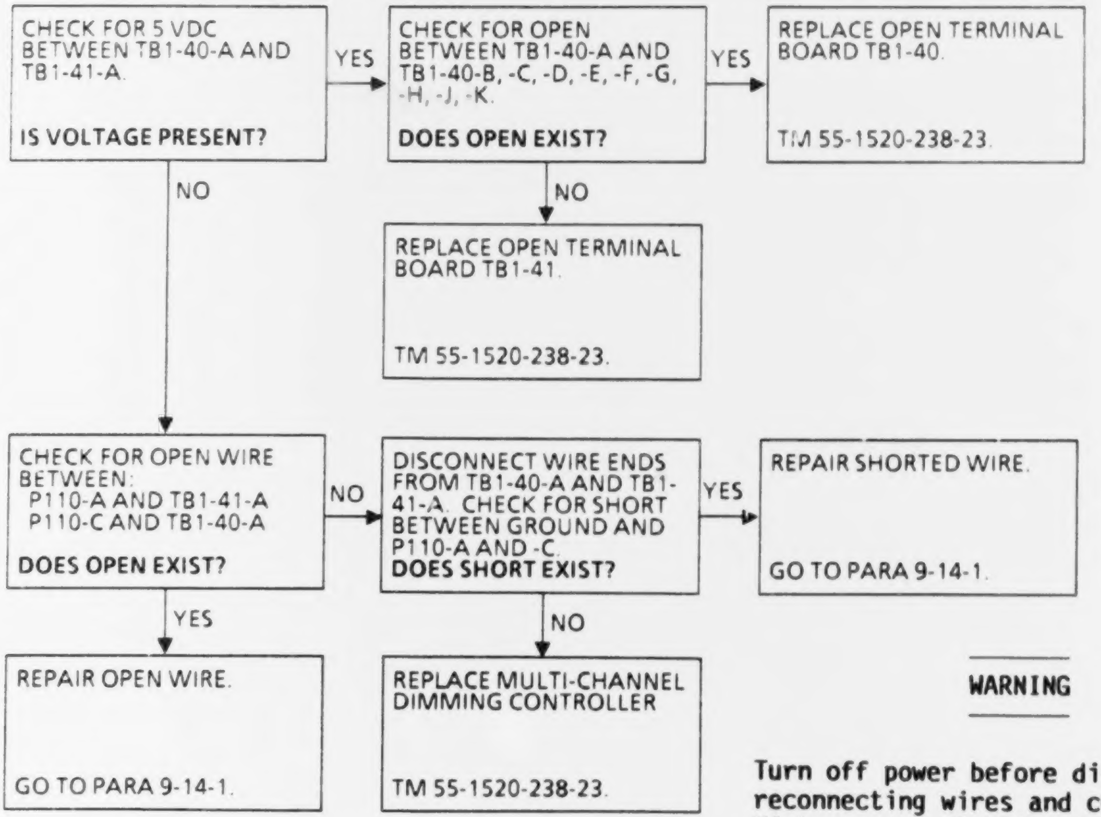
Personnel Required:

68F10 Aircraft Electrician
One person to assist

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Nontransparent Barrier removed

REFER TO VOLTAGE WARNING


CHECK FOR 5 VDC BETWEEN TB1-40-A AND TB1-41-A.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-40-A AND TB1-40-B, -C, -D, -E, -F, -G, -H, -J, -K.
DOES OPEN EXIST?
YES
REPLACE OPEN TERMINAL BOARD TB1-40.
TM 55-1520-238-23.
NO
REPLACE OPEN TERMINAL BOARD TB1-41.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-A AND TB1-41-A
P110-C AND TB1-40-A
DOES OPEN EXIST?
NO
DISCONNECT WIRE ENDS FROM TB1-40-A AND TB1-41-A. CHECK FOR SHORT BETWEEN GROUND AND P110-A AND -C.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER
TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-14-9. ALL CH. 1 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-8)

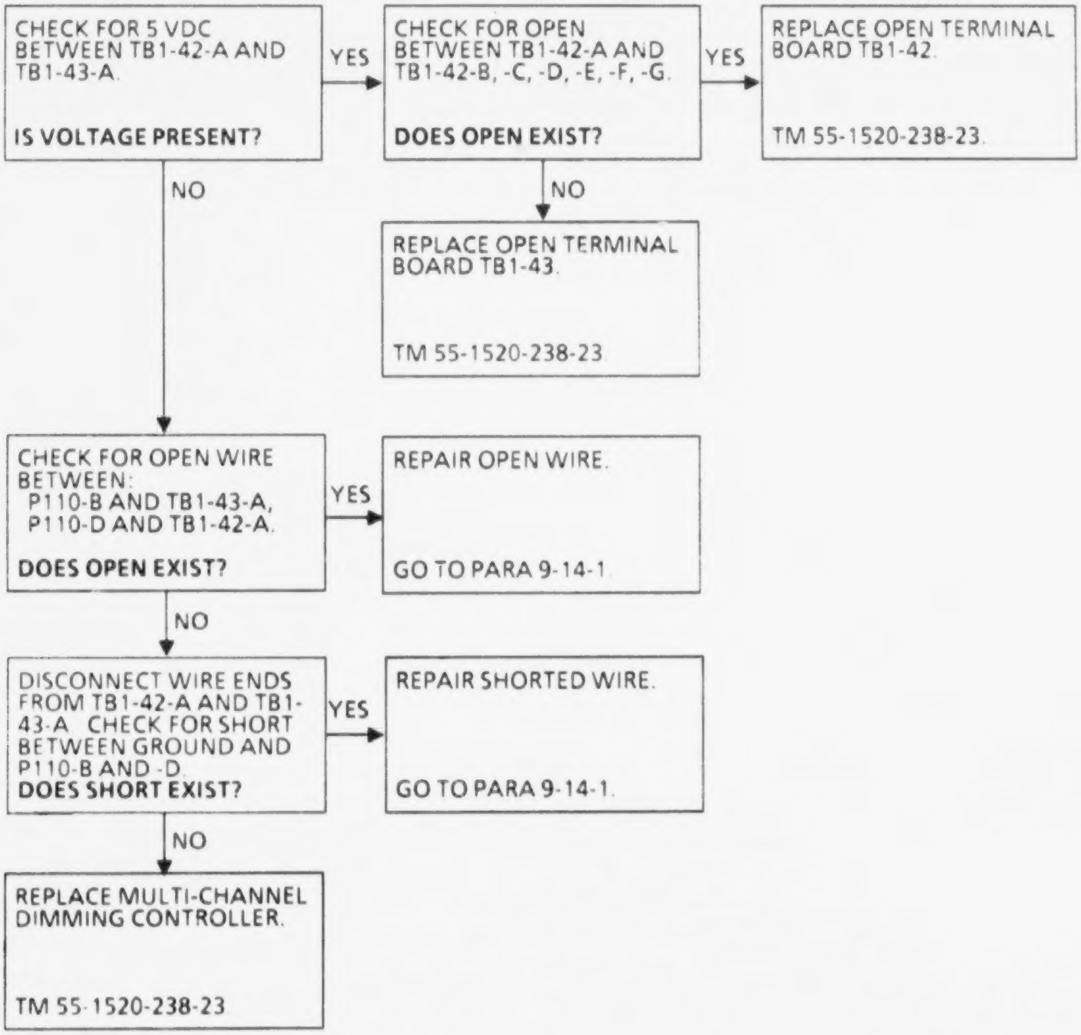
Personnel Required: (para 9-14-8)

References: (para 9-14-8)

Equipment Conditions: (para 9-14-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 5 VDC BETWEEN TB1-42-A AND TB1-43-A. **IS VOLTAGE PRESENT?**

CHECK FOR OPEN BETWEEN TB1-42-A AND TB1-42-B, -C, -D, -E, -F, -G. **DOES OPEN EXIST?**

REPLACE OPEN TERMINAL BOARD TB1-42. TM 55-1520-238-23.

REPLACE OPEN TERMINAL BOARD TB1-43. TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN: P110-B AND TB1-43-A, P110-D AND TB1-42-A. **DOES OPEN EXIST?**

REPAIR OPEN WIRE. GO TO PARA 9-14-1.

DISCONNECT WIRE ENDS FROM TB1-42-A AND TB1-43-A. CHECK FOR SHORT BETWEEN GROUND AND P110-B AND -D. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE. GO TO PARA 9-14-1.

REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23

END OF TASK

9-14-10. ALL CH. 2 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-8)

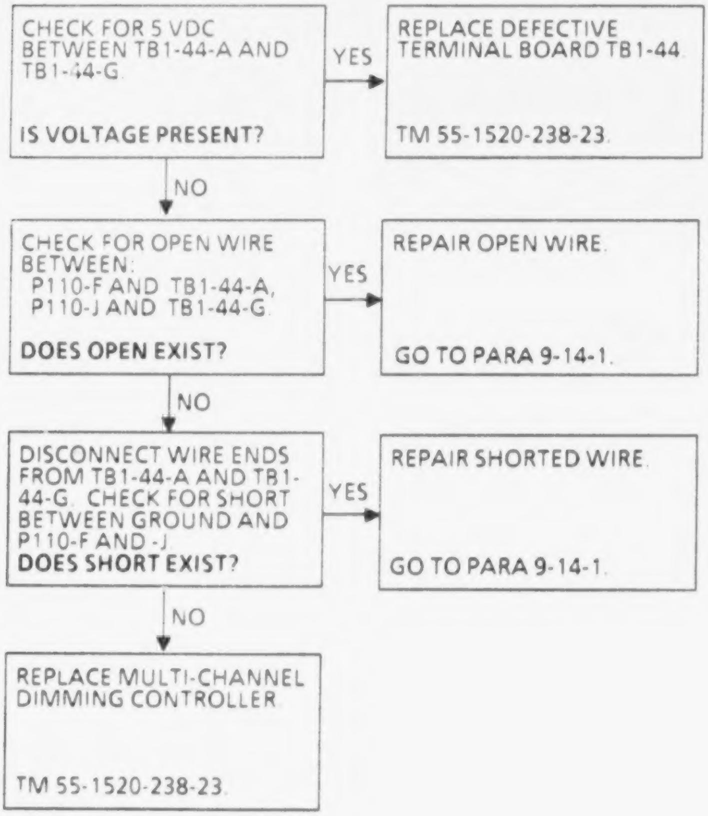
Personnel Required: (para 9-14-8)

References: (para 9-14-8)

Equipment Conditions: (para 9-14-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 5 VDC BETWEEN TB1-44-A AND TB1-44-G.

IS VOLTAGE PRESENT?

REPLACE DEFECTIVE TERMINAL BOARD TB1-44.

TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN:
P110-F AND TB1-44-A,
P110-J AND TB1-44-G.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-14-1.

DISCONNECT WIRE ENDS FROM TB1-44-A AND TB1-44-G. CHECK FOR SHORT BETWEEN GROUND AND P110-F AND -J.

DOES SHORT EXIST?

REPAIR SHORTED WIRE.

GO TO PARA 9-14-1.

REPLACE MULTI-CHANNEL DIMMING CONTROLLER.

TM 55-1520-238-23.

END OF TASK

9-14-11. ALL CH. 3 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-8)

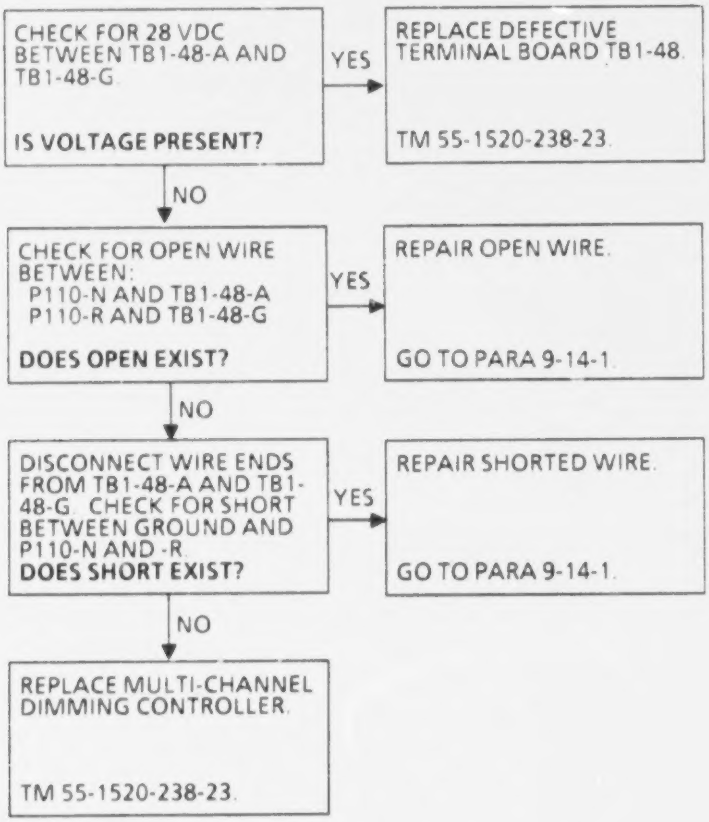
Personnel Required: (para 9-14-8)

References: (para 9-14-8)

Equipment Conditions: (para 9-14-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN TB1-48-A AND TB1-48-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-48.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-N AND TB1-48-A
P110-R AND TB1-48-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-48-A AND TB1-48-G. CHECK FOR SHORT BETWEEN GROUND AND P110-N AND -R.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-12. ALL CH. 3 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999 5282

Personnel Required:

68F10	Aircraft Electrician
	One person to assist

References:

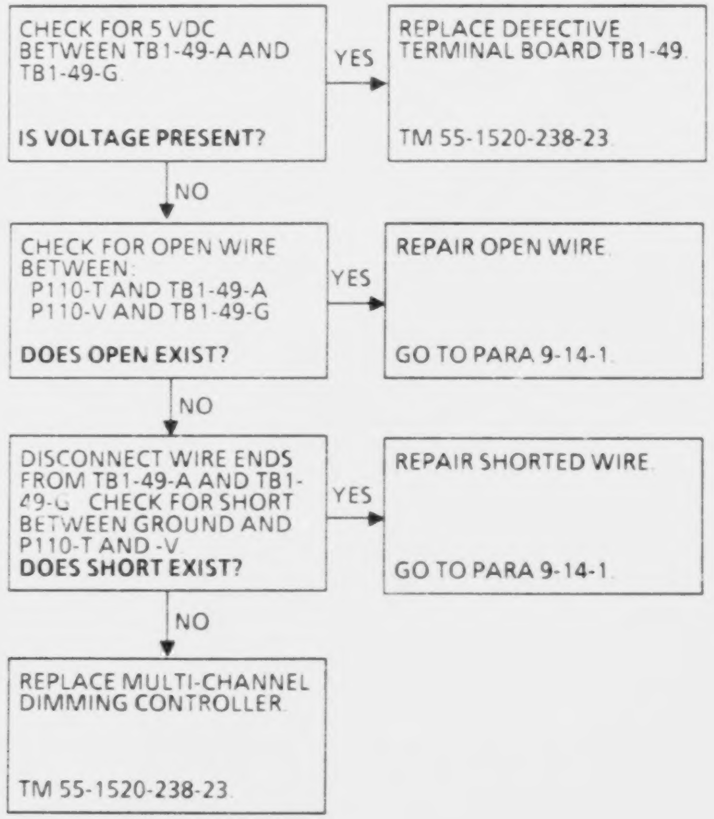
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
	Nontransparent barrier removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 5 VDC BETWEEN TB1-49-A AND TB1-49-G.
IS VOLTAGE PRESENT?

YES: REPLACE DEFECTIVE TERMINAL BOARD TB1-49. TM 55-1520-238-23.

NO: CHECK FOR OPEN WIRE BETWEEN:
P110-T AND TB1-49-A
P110-V AND TB1-49-G
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-14-1.

NO: DISCONNECT WIRE ENDS FROM TB1-49-A AND TB1-49-G. CHECK FOR SHORT BETWEEN GROUND AND P110-T AND -V
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-14-1.

NO: REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-14-13. ALL CH. 4 NO. 1 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-12)

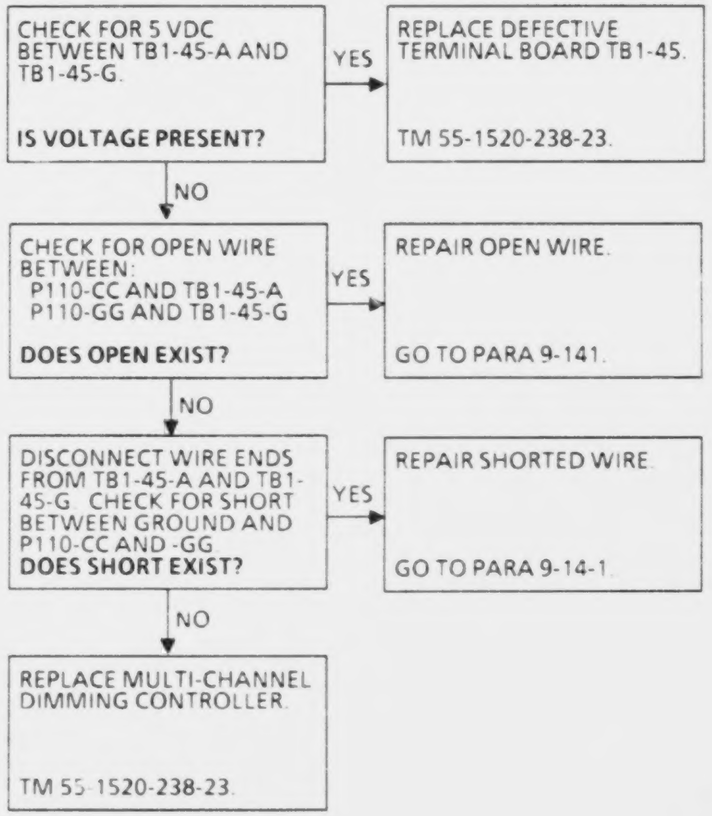
Personnel Required: (para 9-14-12)

References: (para 9-14-12)

Equipment Conditions: (para 9-14-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 5 VDC BETWEEN TB1-45-A AND TB1-45-G.
IS VOLTAGE PRESENT?

YES: REPLACE DEFECTIVE TERMINAL BOARD TB1-45. TM 55-1520-238-23.

NO: CHECK FOR OPEN WIRE BETWEEN:
P110-CC AND TB1-45-A
P110-GG AND TB1-45-G
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-141.

NO: DISCONNECT WIRE ENDS FROM TB1-45-A AND TB1-45-G. CHECK FOR SHORT BETWEEN GROUND AND P110-CC AND -GG
DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE. GO TO PARA 9-14-1.

NO: REPLACE MULTI-CHANNEL DIMMING CONTROLLER. TM 55-1520-238-23.

END OF TASK

9-14-14. ALL CH. 4 NO. 2 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-12)

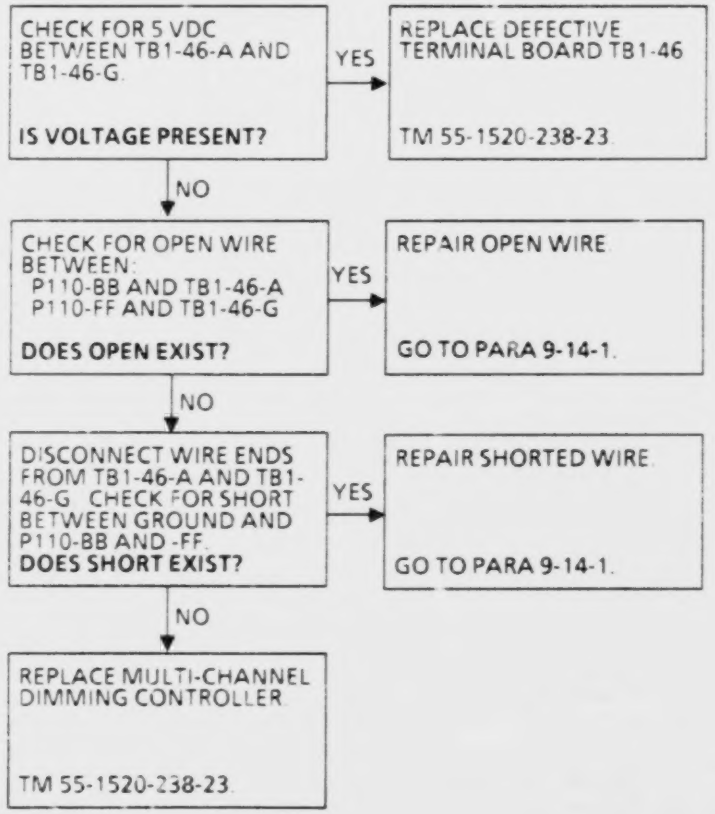
Personnel Required: (para 9-14-12)

References: (para 9-14-12)

Equipment Conditions: (para 9-14-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-46-A AND TB1-46-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-46
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-BB AND TB1-46-A
P110-FF AND TB1-46-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-46-A AND TB1-46-G. CHECK FOR SHORT BETWEEN GROUND AND P110-BB AND -FF.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-15. ALL CH. 4 NO. 3 EDGE-LIGHT PANELS - DO NOT LIGHT

Tools: (para 9-14-12)

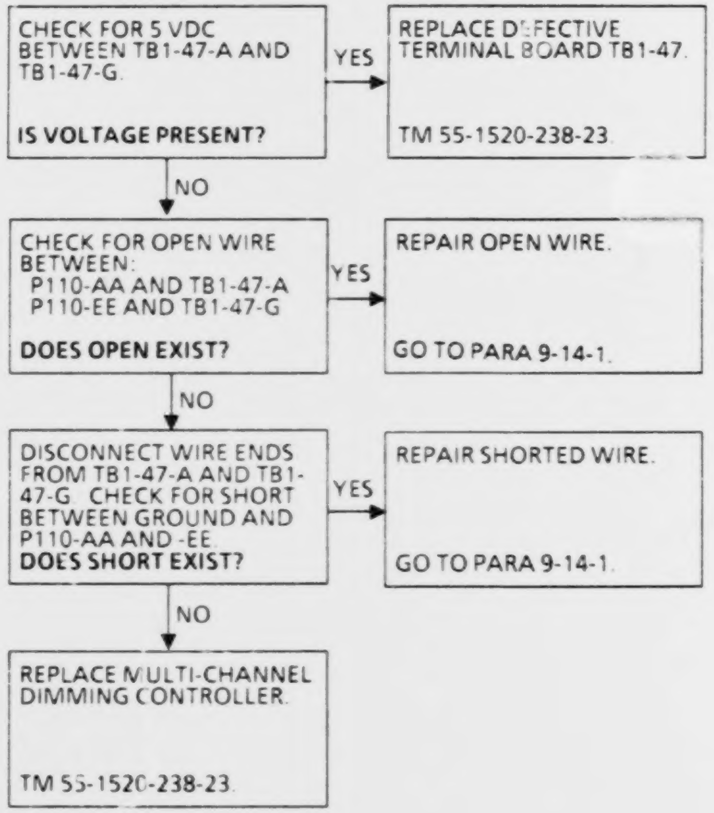
Personnel Required: (para 9-14-12)

References: (para 9-14-12)

Equipment Conditions: (para 9-14-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-47-A AND TB1-47-G.
IS VOLTAGE PRESENT?
YES
REPLACE DEFECTIVE TERMINAL BOARD TB1-47.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN:
P110-AA AND TB1-47-A
P110-EE AND TB1-47-G
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
DISCONNECT WIRE ENDS FROM TB1-47-A AND TB1-47-G. CHECK FOR SHORT BETWEEN GROUND AND P110-AA AND -EE.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-16. CPG INTR LT PANEL EDGE-LIGHT - DOES NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999 6282

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

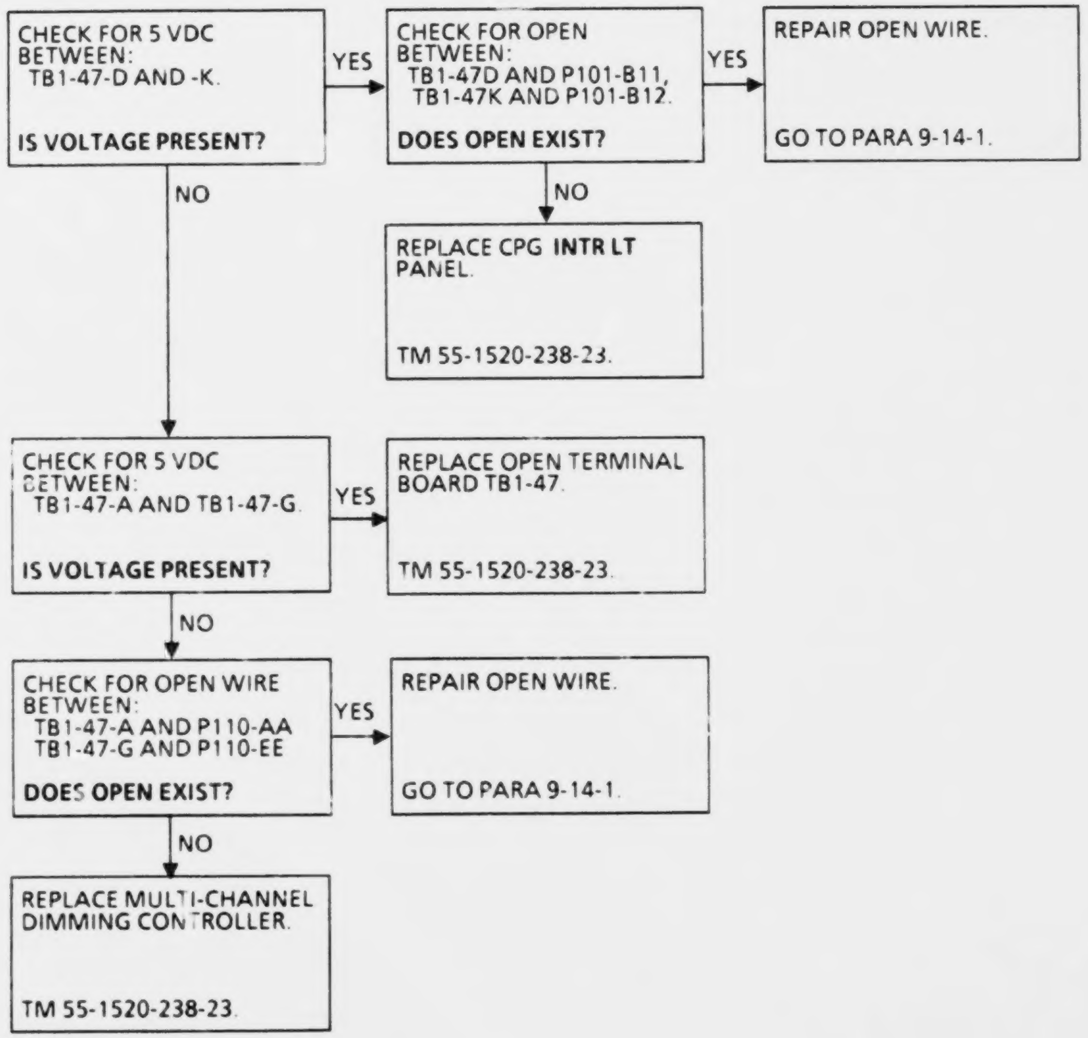
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
	Nontransparent barrier removed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN: TB1-47-D AND -K.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: TB1-47D AND P101-B11, TB1-47K AND P101-B12.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
REPLACE CPG INTR LT PANEL.
TM 55-1520-238-23.
NO
CHECK FOR 5 VDC BETWEEN: TB1-47-A AND TB1-47-G.
IS VOLTAGE PRESENT?
YES
REPLACE OPEN TERMINAL BOARD TB1-47.
TM 55-1520-238-23.
NO
CHECK FOR OPEN WIRE BETWEEN: TB1-47-A AND P110-AA TB1-47-G AND P110-EE
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-14-1.
NO
REPLACE MULTI-CHANNEL DIMMING CONTROLLER.
TM 55-1520-238-23.

END OF TASK

9-14-17. ALL CPG EDGE-LIGHTS ARE NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

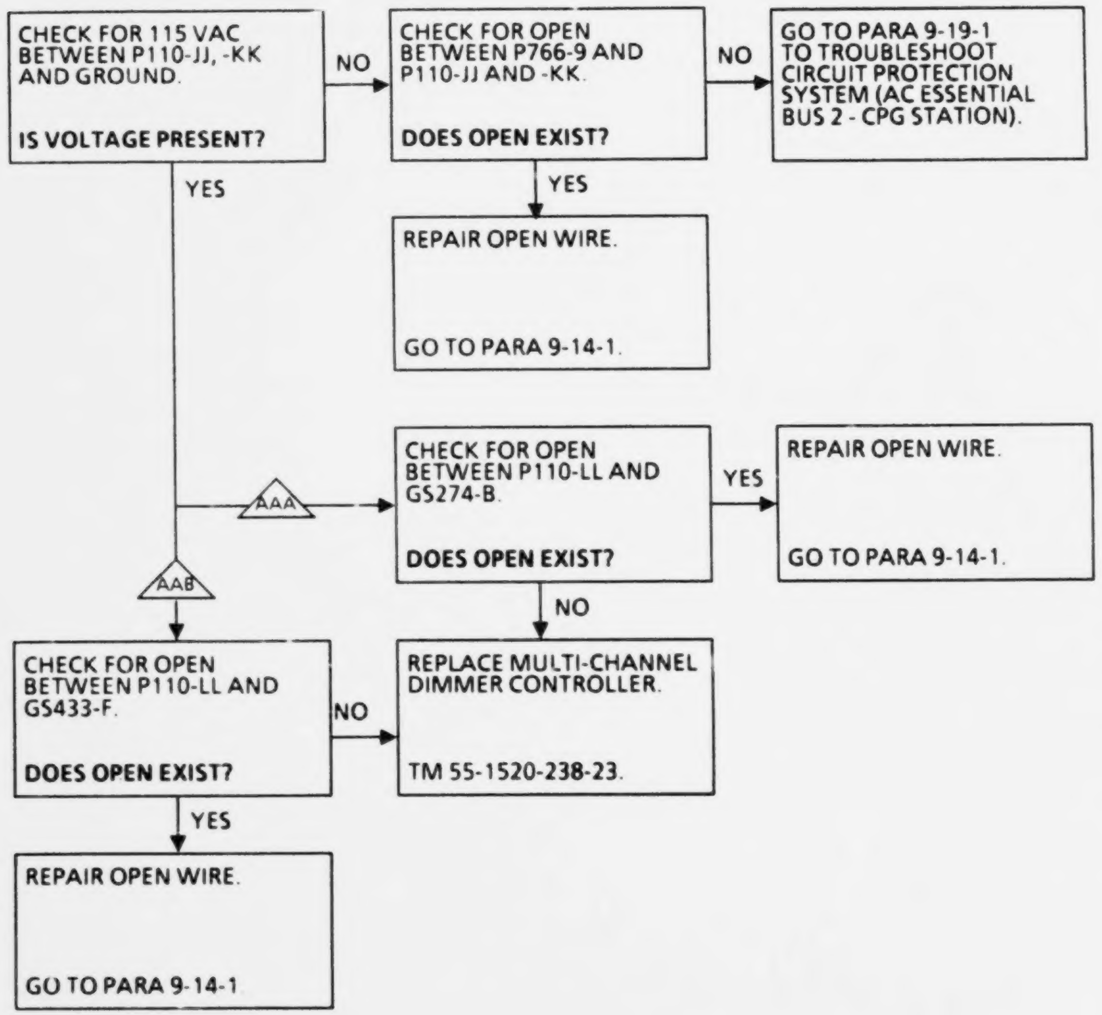
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 115 VAC BETWEEN P110-JJ, -KK AND GROUND.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN P766-9 AND P110-JJ AND -KK.

DOES OPEN EXIST?

GO TO PARA 9-19-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION).

REPAIR OPEN WIRE.

GO TO PARA 9-14-1.

CHECK FOR OPEN BETWEEN P110-LL AND GS274-B.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-14-1.

REPLACE MULTI-CHANNEL DIMMER CONTROLLER.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN P110-LL AND GS433-F.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-14-1

9-15-1. CIRCUIT BREAKER REFERENCE LIST

PILOT CIRCUIT BREAKER PANEL (A76)

CB NO.	NAME	POWER VOLTAGE	POWER AMPS	BUS (OR TYPE)	CIRCUIT BREAKER OUTPUT	MOC PARA NO.
1	POWER XFMR RECT 1	115 VAC	35	AC ESS 1	P3-S, T, U	9-16-1
2	STAB AUTO AC	115 VAC	7.5	AC ESS 1	P1-36	9-16-1
3	STAB AUTO DC	28 VDC	15	DC ESS 3	P2-f	9-23-1
4	POWER XFMR RECT 2	115 VAC	35	AC ESS 2	P4-D, E, F	9-18-1
5	POWER BATT CHGR DC	28 VDC	20	DC ESS 1	P2-a	9-20-1
6	STAB MAN DC	28 VDC	15	DC ESS 1	P2-g	9-20-1
7	STAB MAN AC	115 VAC	1	AC ESS 1	P1-37	9-16-1
8	THROT	28 VDC	5	DC EMERG	J1-d	9-25-1
9	FUEL APU	28 VDC	10	DC EMERG	J1-z	9-25-1
10	APU HOLD	28 VDC	7.5	DC EMERG	J1-B	9-25-1
11	FIRE DETR APU	28 VDC	5	DC EMERG	J1-E	9-25-1
12	FIRE DETR ENG 1	28 VDC	5	DC EMERG	J1-F	9-25-1
13	FIRE DETR ENG 2	28 VDC	5	DC EMERG	J1-G	9-25-1
14	FUEL VLV ACTR	28 VDC	5	DC EMERG	J1-C	9-25-1
15	FIRE EXTGH CPG	28 VDC	5	DC EMERG	J1-H	9-25-1
16	ENG LVR	28 VDC	5	DC EMERG	J1-K	9-25-1
17	ENG INST	28 VDC	10	DC EMERG	J1-L, M	9-25-1
18	ASE AC	115 VAC	1*	AC ESS 1	P1-54	9-16-1
19	STBY ATTD	28 VDC	5	DC EMERG	J1-e	9-25-1
21	LT CAUT	28 VDC	10	DC EMERG	J1-y	9-25-1
22	LT SRCH/LDG	28 VDC	25	DC EMERG	P5-4	9-25-1
23	LT UTIL SEC	28 VDC	5	DC EMERG	J1-U, W	9-25-1
24	COMM UHF AM	28 VDC	5	DC EMERG	J1-v	9-25-1
25	FIRE EXTGH PLT	28 VDC	5	DC EMERG	J1-D	9-25-1
26	FIRE EXTGH APU	28 VDC	5	DC EMERG	J1-J	9-25-1
27	COMM ICS	28 VDC	5	DC EMERG	J1-a	9-25-1
28	ASE DC	28 VDC	5	DC ESS 3	P1-34	9-23-1
29	COMM IFF	28 VDC	5	DC EMERG	J1-S	9-25-1
30	COMM KY28	28 VDC	5	DC EMERG	J1-p	9-25-1
31	RDR ALT	28 VDC	5	DC EMERG	J1-f, g	9-25-1
32	FUEL FILL	28 VDC	5	DC EMERG	J1-A	9-25-1
34	JETT	28 VDC	5	DC EMERG	J1-P, R	9-25-1
35	EMERG HYD	28 VDC	5	DC EMERG	J1-k, m	9-25-1
36	PITOT HTR	28 VDC	7.5	DC EMERG	J1-s	9-25-1
37	RTR BRK	28 VDC	5	DC EMERG	J1-n	9-25-1
■ 38	ECS L NOSE GRBX HTR	115 VAC	20	AC ESS 1	P2-m, n, p	9-16-1
39	LT PRI	115 VAC	5	AC ESS 1	P1-45	9-16-1
40	LT ANTI COL	115 VAC	5	AC ESS 1	P1-44	9-16-1
41	MISSION IHADSS	115 VAC	5	AC ESS 1	P1-11, 12, 13	9-16-1
42	NAV HARS AC	115 VAC	5	AC ESS 1	P1-38, 39, 40	9-16-1
43	NAV HSI	115 VAC	5	AC ESS 1	P1-26	9-16-1
44	POWER ENG 2	115 VAC	5	AC ESS 2	P1-23	9-18-1
45	MISSION SYM GEN	115 VAC	5	AC ESS 1	P1-52	9-16-1
46	MISSION ARM CONTR	28 VDC	10	DC ESS 2	P2-E	9-22-1
47	MISSION RKT ELEX	28 VDC	5	DC ESS 3	P1-27	9-23-1
48	CHAFF	28 VDC	10	DC EMERG	J1-t	9-25-1
	PILOT CIRCUIT BREAKER PANEL (A76) (cont)					
49	MISSION PEN AIDS CONTR	28 VDC	1	DC ESS 2	P1-49	9-22-1
50	MISSION FC DC	28 VDC	5	DC ESS 3	P1-17	9-23-1
51	MISSION FC AC	115 VAC	5	AC ESS 1	P1-28	9-16-1
52	ENG WARN	28 VDC	5	DC EMERG	J1-N	9-25-1
53	RDR WARN	28 VDC	5	DC EMERG	J1-q	9-25-1
54	NAV HARS DC	28 VDC	5	DC ESS 3	P1-46	9-23-1
55	FUEL XFEED	28 VDC	7.5	DC EMERG	P1-32	9-25-1
56	FUEL TRANS	28 VDC	10	DC ESS 2	P2-D	9-22-1
57	FUEL BST	28 VDC	7.5	DC ESS 2	P1-31, 48	9-22-1
58	ENG START	28 VDC	5	DC EMERG	J1-X, c	9-25-1
59	TWHL LOCK	28 VDC	5	DC ESS 2	P1-15	9-22-1
60	ENG CUT	28 VDC	5	DC EMERG	J1-b	9-25-1
61	MISSION PNVS DC	28 VDC	15	DC ESS 3	P2-k	9-23-1
62	POWER ENG 1	115 VAC	5	AC ESS 1	P1-22	9-16-1
63	IR JAM PWR	Ground	0.5	DC GND	P1-50	9-27-1
64	COMM VHF FM	28 VDC	5	DC EMERG	J1-w	9-25-1
65	COMM ADF	28 VDC	5	DC EMERG	J1-r	9-25-1
66	IR JAM XMTR	28 VDC	15	DC ESS 2	P2-h	9-22-1
67	ECS ENG ANTI ICE	28 VDC	5	DC ESS 1	P1-4	9-20-1
68	ECS ICE DET	28 VDC	5	DC ESS 3	P1-47	9-23-1
69	NAV AIR DATA DC	28 VDC	10	DC ESS 3	P2-J	9-23-1
70	ECS CANOPY ANTI ICE CONTR	28 VDC	5	DC ESS 1	P1-3	9-20-1
71	ECS WSHLD WPR	28 VDC	15	DC ESS 1	P2-b	9-20-1
72	MISSION RDR JAM DC	Ground	0.5	DC GND	P1-1	9-27-1
73	LT NAV	28 VDC	5	DC ESS 2	P1-25	9-22-1
74	MISSION RDR JAM AC	115 VAC	5	AC ESS 1	P1-5, 6, 7	9-16-1
75	ECS AFT FAN	115 VAC	5	AC ESS 2	P2-A, B, C	9-18-1
76	ECS CAB	28 VDC	5	DC EMERG	P1-2	9-25-1
77	ASE BUCS	28 VDC	5	DC ESS 3	P1-33	9-23-1
78	ECS CANOPY ANTI ICE	115 VAC	20	AC ESS 2	P2-c, d, e	9-18-1
79	VIB MON	28 VDC	5	DC ESS 2	P1-10	9-22-1
80	LT SRCH/LDG CONTR	28 VDC	5	DC EMERG	J1-V	9-25-1
81	MISSION PNVS AC	115 VAC	5	AC ESS 1	P2-N, P, R	9-16-1
82	NAV DPLR	28 VDC	5	DC ESS 3	P1-51	9-23-1
83	ECS BLADE DEICE CONTR	28 VDC	5	DC ESS 3	P1-14	9-23-1
84	NAV AIR DATA AC	115 VAC	5	AC ESS 1	P2-F, G, H	9-16-1
85	ECS BLADE DEICE	28 VDC	1	DC ESS 3	P1-53	9-23-1
86	POWER BATT CHGR AC	115 VAC	5	AC ESS 2	P1-35	9-18-1
87	TRIM	28 VDC	5	DC EMERG	J1-Y, Z	9-25-1
88	ECS FAB FANS	115 VAC	7.5	AC ESS 2	P2-K, L, M	9-18-1
89	MISSION JETT	28 VDC	5	DC ESS 2	P1-18	9-22-1
90	LT FORM	115 VAC	5	AC ESS 1	P1-24	9-16-1
91	NAV VDU	28 VDC	5	DC ESS 2	P1-41, 42	9-22-1
92	MISSION EL AC	115 VAC	5	AC ESS 1	P1-30	9-16-1
93	MISSION EL DC	28 VDC	5	DC ESS 2	P1-29	9-22-1
■ 94	CBR BLWR	28 VAC	5	DC ESS 1	P1-19	9-20-1

GO TO NEXT PAGE

9-15-1. CIRCUIT BREAKER REFERENCE LIST (cont)

CB NO.	NAME	POWER VOLTAGE	POWER AMPS	BUS (OR TYPE)	CIRCUIT BREAKER OUTPUT	MOC PARA NO.
	PILOT CIRCUIT BREAKER PANEL (A76) (cont)					
211	ECS R NOSE GRBX HTR	115 VAC	20	AC ESS 1	P2-q, r, s	9-16-1
212	ECS ICE DET HTR	115 VAC	3	AC ESS 2	P1-9	9-16-1
	CPG CIRCUIT BREAKER PANEL NO. 1 (A77)					
1	MUX L PYL INBD	28 VDC	5	DC ESS 3	P2-9	9-24-1
2	MUX L PYL OUTBD	28 VDC	5	DC ESS 3	J2-11	9-24-1
3	AWS MTR	115 VAC	30	AC ESS 2	J3-4, 5, 6	9-19-1
4	FC FCC DC	28 VDC	7.5	DC ESS 3	J2-32	9-24-1
5	MUX R PYL INBD	28 VDC	5	DC ESS 3	J2-8	9-24-1
6	MUX R PYL OUTBD	28 VDC	5	DC ESS 3	J2-10	9-24-1
7	AWS AMMO	115 VAC	15	AC ESS 2	J2-1, 15, 22	9-19-1
8	FC RC DR	115 VAC	5	AC ESS 2	J2-16	9-19-1
9	MUX FAB R	28 VDC	5	DC ESS 3	J2-13	9-24-1
10	MUX FAB L	28 VDC	5	DC ESS 3	J2-14	9-24-1
11	AWS AWS AC	115 VAC	5	AC ESS 1	J2-12, 19	9-17-1
12	AWS AWS DC	28 VDC	5	DC ESS 3	J2-24, 33	9-24-1
13	EMERG BATT ICS	28 VDC	5	DC EMERG	J1-5	9-26-1
14	PRI LT	115 VAC	5	AC ESS 2	J1-9	9-19-1
15	MUX CPG	28 VDC	5	DC ESS 3	J2-7	9-24-1
16	FC FCC AC	115 VAC	5	AC ESS 1	J2-35	9-17-1
17	MSL DC ELEC	28 VDC	5	DC ESS 3	J2-21, 20	9-24-1
18	MSL R OUTBD LCHR AC	115 VAC	2	AC ESS 1	J2-5	9-17-1
19	MSL R OUTBD LCHR DC	Ground	0.5	DC GND	J2-18	9-28-1
20	AFTD IND	115 VAC	5	AC ESS 1	J1-6	9-17-1
21	MSL R INBD LCHR AC	115 VAC	2	AC ESS 1	J2-4	9-17-1
22	MSL R INBD LCHR DC	Ground	0.5	DC GND	J2-25	9-28-1
23	MSL L INBD LCHR DC	Ground	0.5	DC GND	J2-6	9-28-1
24	MSL L INBD LCHR AC	115 VAC	2	AC ESS 1	J2-3	9-17-1
25	MSL L OUTBD LCHR DC	Ground	0.5	DC GND	J2-17	9-28-1
26	MSL L OUTBD LCHR AC	115 VAC	2	AC ESS 1	K2-2	9-17-1
27	MSL ARM	Ground	0.5	DC GND	J2-23	9-28-1
28	EMERG BATT CAUT	28 VDC	7.5	DC EMERG	J1-4	9-26-1
29	EMERG BATT UTIL SEC LT	28 VDC	5	DC EMERG	J1-2, 3	9-26-1
31	EMERG BATT ENG INST	28 VDC	10	DC EMERG	J1-10, 8	9-26-1
32	EMERG BATT VHF AM/FM	28 VDC	5	DC EMERG	J1-7	9-26-1

CB NO.	NAME	POWER VOLTAGE	POWER AMPS	BUS (OR TYPE)	CIRCUIT BREAKER OUTPUT	MOC PARA NO.
CPG CIRCUIT BREAKER PANEL NO. 2 (A97)						
1	IHADSS	115 VAC	5	AC ESS 1	P1-C, D, E	9-17-1
2	TADS DC	28 VDC	30	DC ESS 1	J1-C, G, L, M	9-21-1
3	TADS AC	115 VAC	10	AC ESS 1	J1-E, F, H	9-17-1
4	LASER	115 VAC	2	AC ESS 1	J1-A, B, D	9-17-1
5	CBR BLWR	28 VDC	5	DC ESS 1	J1-K	9-21-1
6	CDU	28 VDC	5	DC ESS 3	P1-H	9-24-2
UTILITY POWER DISTRIBUTION CIRCUIT BREAKERS (A3)						
6	AC ELEC UTIL PWR	115 VAC	10	AC ESS 2	J16-E, F, B	9-2-2
7	DC ELEC UTIL PWR	28 VDC	35	DC ESS 1	J16-A	9-3-1
94	NITROGEN INERT	115 VAC	5	AC ESS 2	P1085-1	9-5-2
AFT AVIONICS BAY CIRCUIT BREAKERS						
8	MAINT LT	24 VDC	5	BATTERY	J111-A, P463-B3	9-10-1
148	APU	24 VDC	7.5	BATTERY	P430-A4	CHAPTER 15

9-15-2. PILOT CIRCUIT BREAKER PANEL - ACCESSING, SECURING PROCEDURE

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

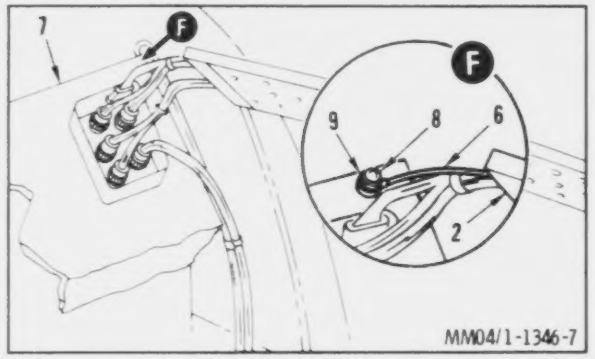
TM 55-1520-238-23

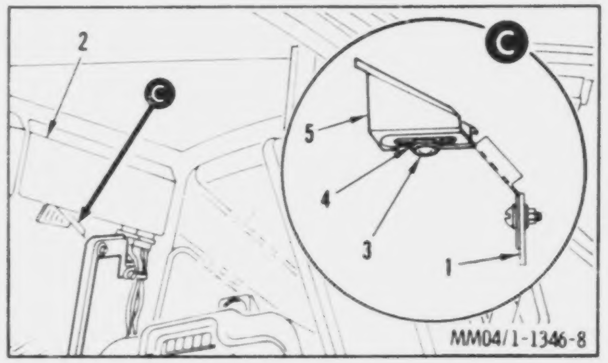
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed

A. ACCESSING PANEL

1. **Detach left glareshield (1) from pilot circuit breaker panel (2).** Remove one screw (3) and washer (4) that secures glareshield (1) to bracket (5).
2. **Remove bonding strap (6) from airframe (7).** Remove one screw (8) and washer (9).





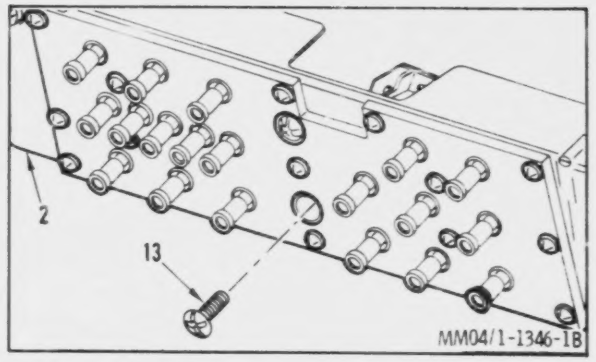
CAUTION

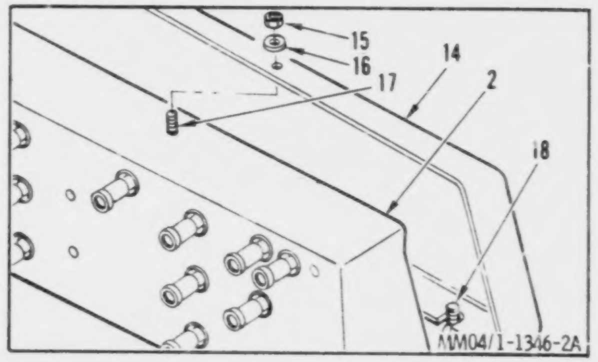
Remove two aft screws first, then support forward end of panel while removing remaining two screws to prevent damage to transparent barrier or pilot glareshield.

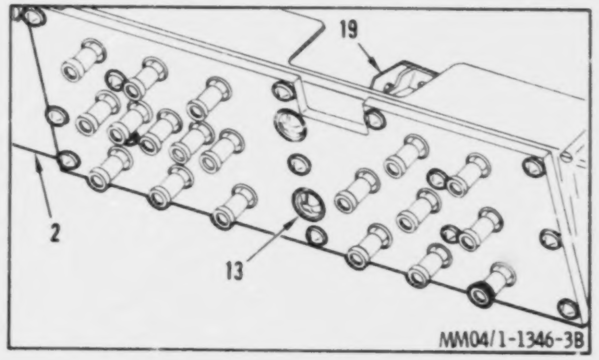
3. **Dismount circuit breaker panel (2).** Remove four screws (13).
4. **Remove back cover (14) from panel (2).** Remove nuts (15) and washers (16) from studs (17) and screws (18) as required.

B. SECURING PANEL

1. **Install back cover (14) on panel (2).**
   a. Position cover (14) over studs (17).
   b. Install washers (16) and nuts (15) on studs (17) and screws (18) as required.
2. **Fasten pilot circuit breaker panel (2) to mounting bracket (19).** Install four screws (13).





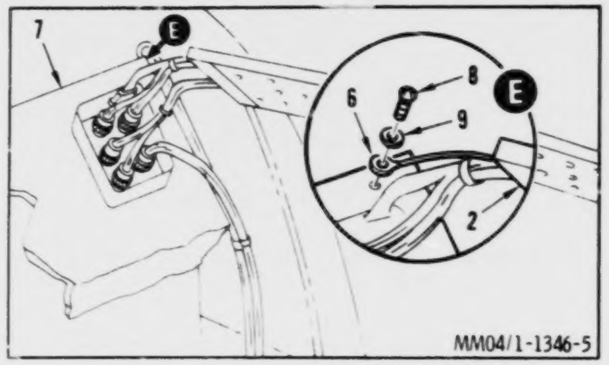


GO TO NEXT PAGE

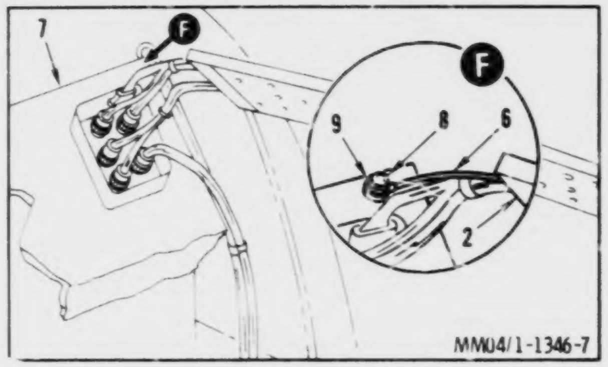
9-15-2. PILOT CIRCUIT BREAKER PANEL - ACCESSING, SECURING PROCEDURE (cont)

3. Install bonding strap (6) on airframe (7), by installing one screw (8) and washer (9).

4. Fasten left vertical glareshield (1) to circuit breaker panel (2). Install screw (3) and washer (4).



MM04/1-1346-5



MM04/1-1346-7

END OF TASK

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

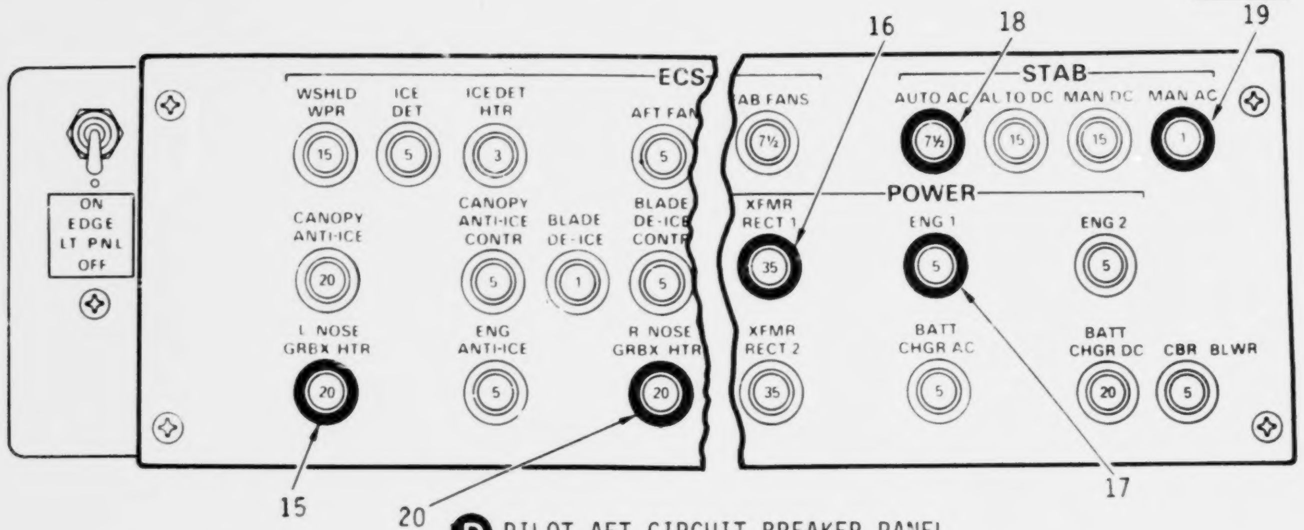
TM 55-1520-238-23

Equipment Conditions:

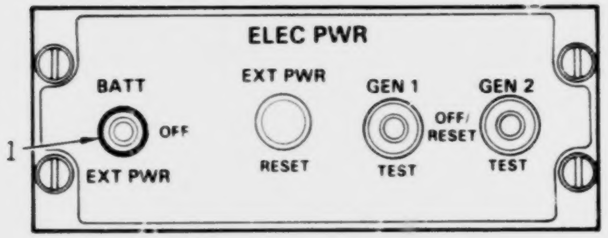
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

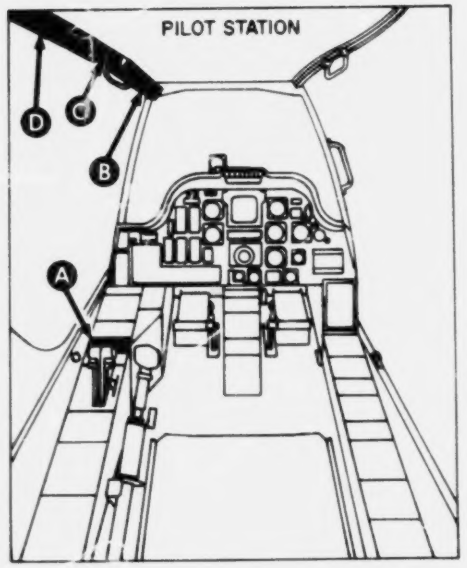
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

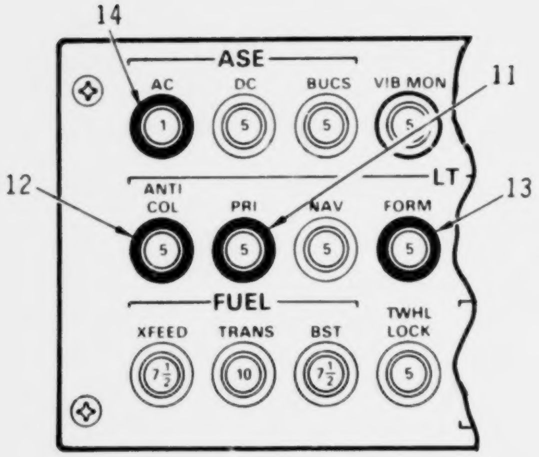


D PILOT AFT CIRCUIT BREAKER PANEL

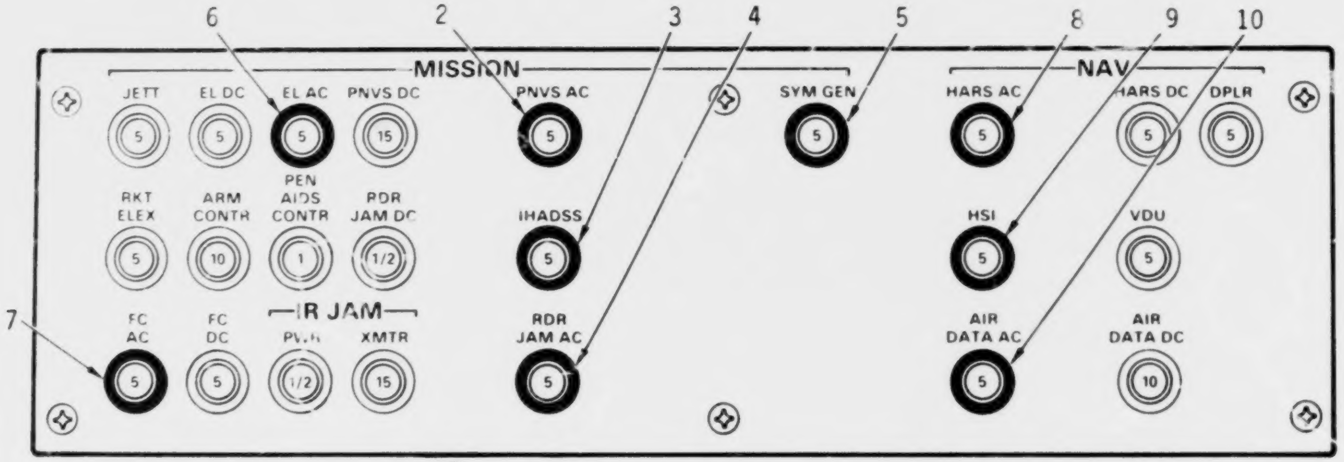


A ELEC PWR PANEL





C PILOT CENTER CIRCUIT BREAKER PANEL



B PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1006-1F

GO TO NEXT PAG

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)

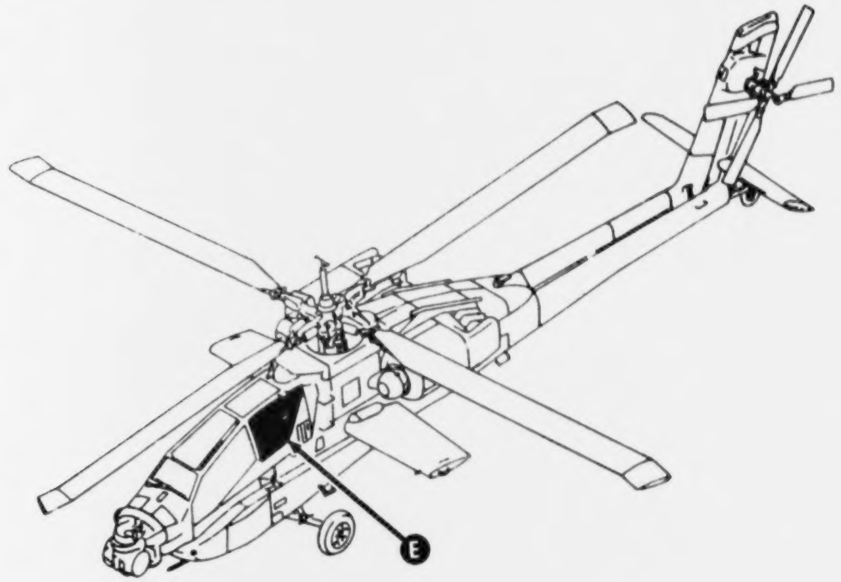
A. On electrical power distribution box, disconnect A76P1, A76P2, and A76P3.

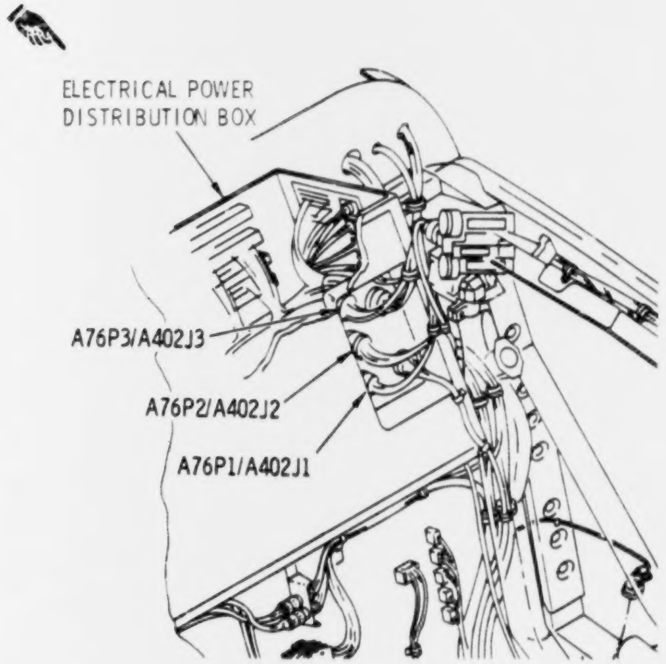
B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P3-G, -H, -J; -K, -L, -M; -N, -P and -R.	If short exists, go to para 9-16-4.
1.1 On pilot ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
1.2 On electrical power distribution box, check for 115 VAC at A402J3-G, -H, -J, -K, -L, -M, -N, -P and -R.	If 115 VAC is not present, go to para 9-2-2.
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and reconnect A76P3, A76P1, and A76P2.	
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
. On pilot forward circuit breaker panel, close the following circuit breakers: **MISSION PNVS AC** (CB81) (2), **MISSION IHADSS** (CB41) (3), **MISSION RDR JAM AC** (CB74) (4), **MISSION SYM GEN** (CB45) (5), **MISSION EL AC** (CB92) (6), **MISSION FC AC** (CB51) (7), **NAV HARS AC** (CB42) (8), **NAV HSI** (CB43) (9), and **NAV AIR DATA AC** (CB84) (10).	If CB81 (2) does not stay closed, go to para 9-16-5. If CB41 (3) does not stay closed, go to para 9-16-6. If CB74 (4) does not stay closed, go to para 9-16-7. If CB45 (5) does not stay closed, go to para 9-16-10. If CB92 (6) does not stay closed, go to para 9-16-16. If CB51 (7) does not stay closed, go to para 9-16-17. If CB42 (8) does not stay closed, go to para 9-16-9. If CB43 (9) does not stay closed, go to para 9-16-14. If CB84 (10) does not stay closed, go to para 9-16-8.
5. On pilot center circuit breaker panel, close the following circuit breakers: **LT PRI** (CB37) (11), **LT ANTI COL** (CB40) (12), **LT FORM** (CB90) (13), and **ASE AC** (CB18) (14).	If CB39 (11) does not stay closed, go to para 9-16-11. If CB40 (12) does not stay closed, go to para 9-16-12. If CB90 (13) does not stay closed, go to para 9-16-13. If CB18 (14) does not stay closed, go to para 9-16-15.
6. On pilot aft circuit breaker panel, close the following circuit breakers: **ECS L NOSE GRBX HTR** (CB38) (15), **POWER XFMR RECT 1** (CB1) (16), **POWER ENG 1** (CB62) (17), **STAB AUTO AC** (CB2) (18), **STAB MAN AC** (CB7) (19), and **ECS R NOSE GRBX HTR** (CB211)(20).	If CB38 (15) does not stay closed, go to para 9-16-18. If CB1 (16) does not stay closed, go to para 9-16-19. If CB62 (17) does not stay closed, go to para 9-16-20. If CB2 (18) does not stay closed, go to para 9-16-21. If CB7 (19) does not stay closed, go to para 9-16-22. If CB211 (20) does not stay closed, go to para 9-16-23.
7. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
8. On electrical power distribution box, disconnect P2 from J2.	
9. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
10. Check for 115 VAC to PNVS between ground and P2-N, -P, -R.	If 115 VAC is not present, go to para 9-16-5.
11. Check for 115 VAC to OAS between ground and P2-F, -G, and -H.	If 115 VAC is not present, go to para 9-16-8.

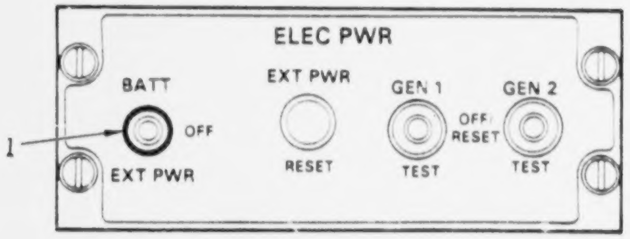
GO TO NEXT PAGE

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)





E PILOT STATION (LEFT CONSOLE)



PILOT ELEC PWR PANEL

MM04/1-1006-2B

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

GO TO NEXT PAGE

9-16-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)

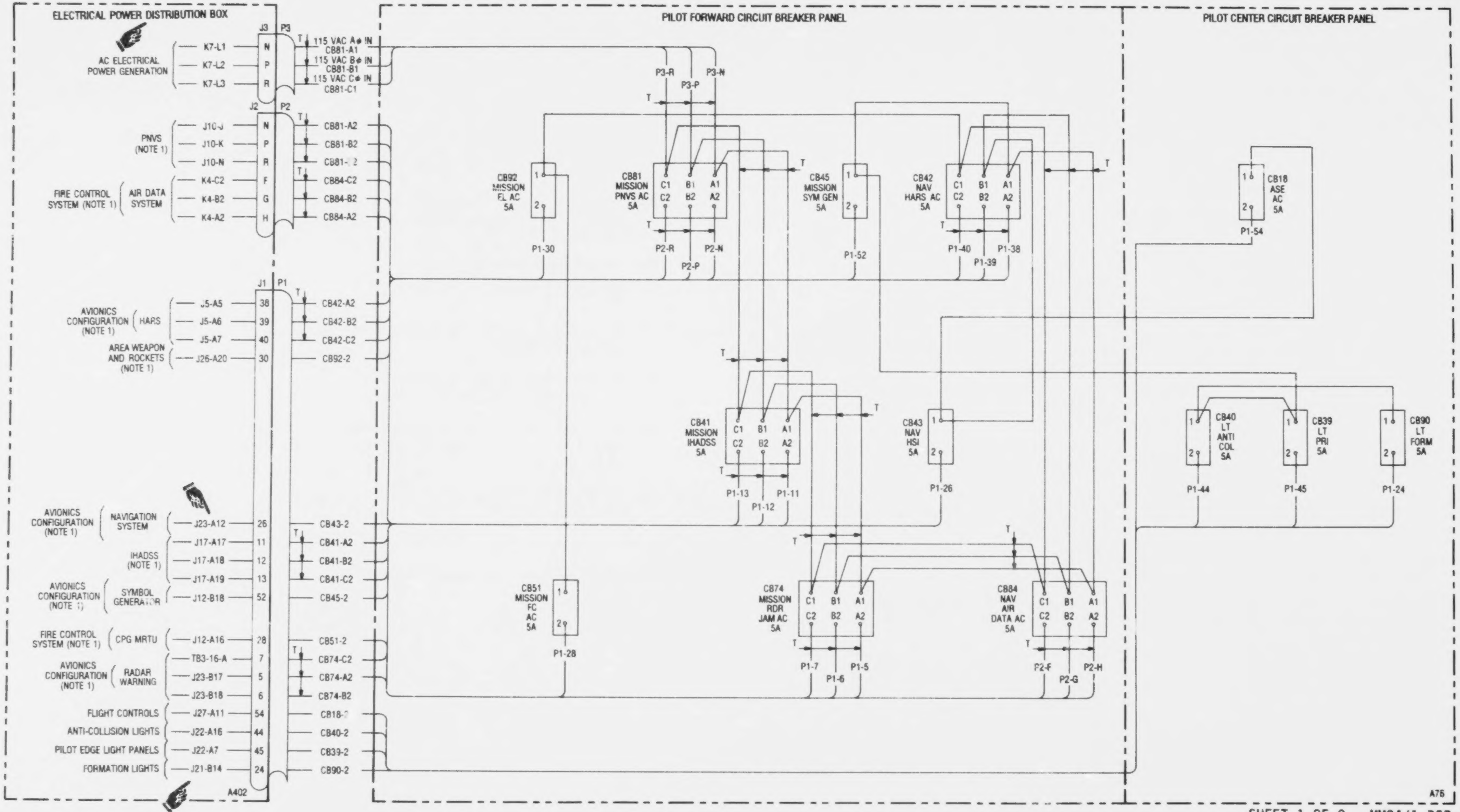
TASK	RESULT
12. Check for 115 VAC to anti-ice between ground and P2-p, -n, -m.	If 115 VAC is not present, go to para 9-16-18.
13. Check for 115 VAC to anti-ice between ground and P2-q, -r, -s.	If 115 VAC is not present, go to para 9-16-23.
14. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
15. On electrical power distribution box, reconnect P2 and disconnect P1.	
16. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
17. Check for 115 VAC to radar jammer between ground and P1-5, -6, -7.	If 115 VAC is not present, go to para 9-16-7.
18. Check for 115 VAC to IHADSS between ground and P1-11, -12, -13.	If 115 VAC is not present, go to para 9-16-6.
19. Check for 115 VAC to HARS between ground and P1-38, -39, -40.	If 115 VAC is not present, go to para 9-16-9.
20. Check for 115 VAC to symbol generator between ground and P1-52.	If 115 VAC is not present, go to para 9-16-10.
21. Check for 115 VAC to multi-channel dimming controller between ground and P1-45.	If 115 VAC is not present, go to para 9-16-11.
22. Check for 115 VAC to anti-collision light between ground and P1-44.	If 115 VAC is not present, go to para 9-16-12.
23. Check for 115 VAC to formation light between ground and P1-24.	If 115 VAC is not present, go to para 9-16-13.
24. Check for 115 VAC to horizontal situation indicator between ground and P1-26.	If 115 VAC is not present, go to para 9-16-14.
25. Check for 115 VAC to ASE actuators between ground and P1-54.	If 115 VAC is not present, go to para 9-16-15.

TASK	RESULT
26. Check for 115 VAC to stores elevation controller between ground and P1-30.	If 115 VAC is not present, go to para 9-16-16.
27. Check for 115 VAC between ground and A76P1-28.	If 115 VAC is not present, go to para 9-16-17.
28. Check for 115 VAC to engine no. 1 power transformer between ground and P1-22.	If 115 VAC is not present, go to para 9-16-20.
29. Check for 115 VAC to stabilator control unit between ground and P1-36.	If 115 VAC is not present, go to para 9-16-21.
30. Check for 115 VAC to stabilator position indicator between ground and P1-37.	If 115 VAC is not present, go to para 9-16-22.
31. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
32. On electrical power distribution box, reconnect P1 and disconnect P3.	
33. Check for continuity to transformer rectifier no. 1 between P3-K, -S; P3-L, -T; P3-M, -U.	If continuity does not exist, go to para 9-16-19.
34. On electrical power distribution box, reconnect P3.	

C. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

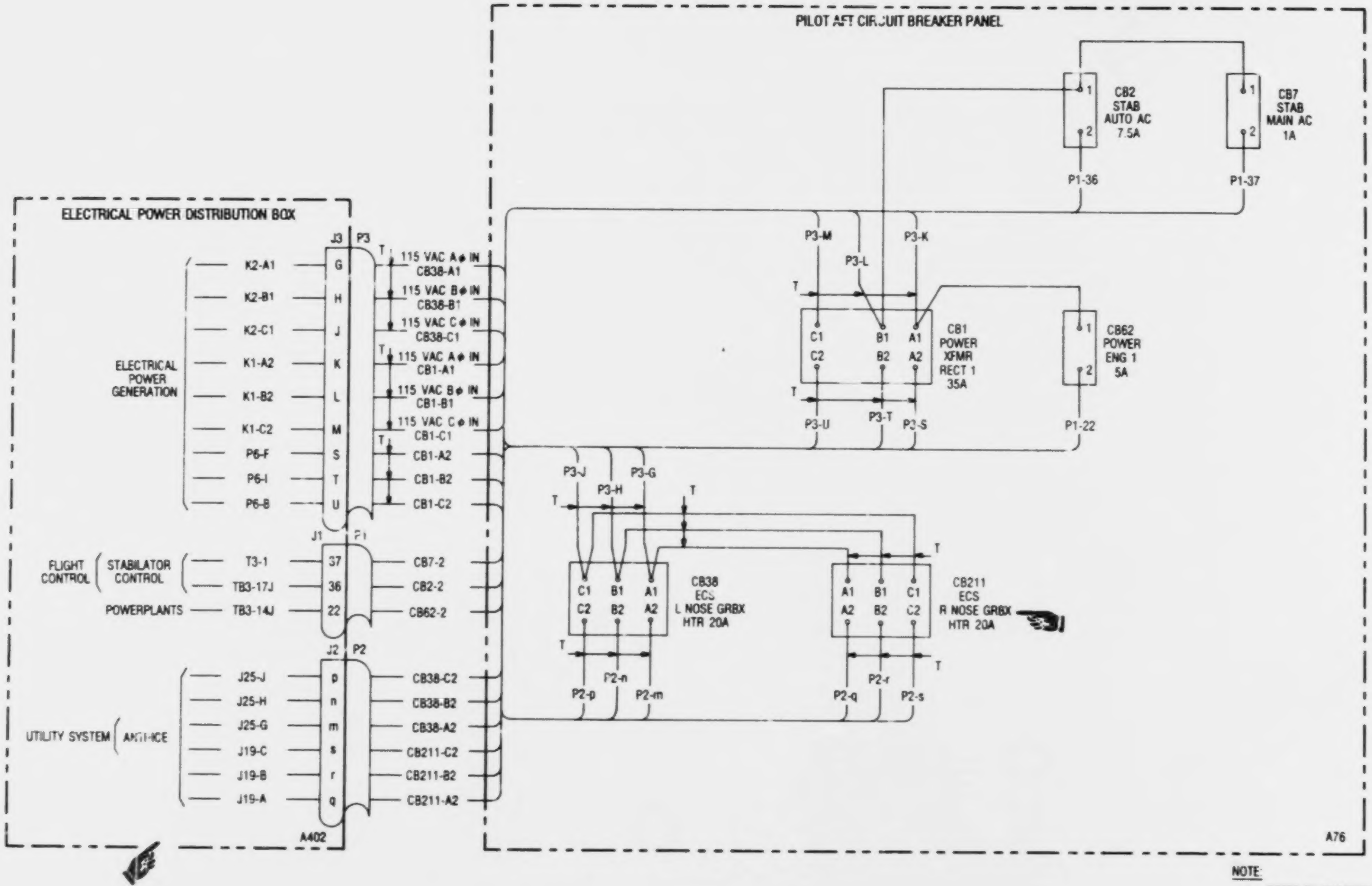
END OF TASK

9-16-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - INTERCONNECTION DIAGRAM



SHEET 1 OF 2 MM04/1-757-1A

9-16-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - INTERCONNECTION DIAGRAM (cont)

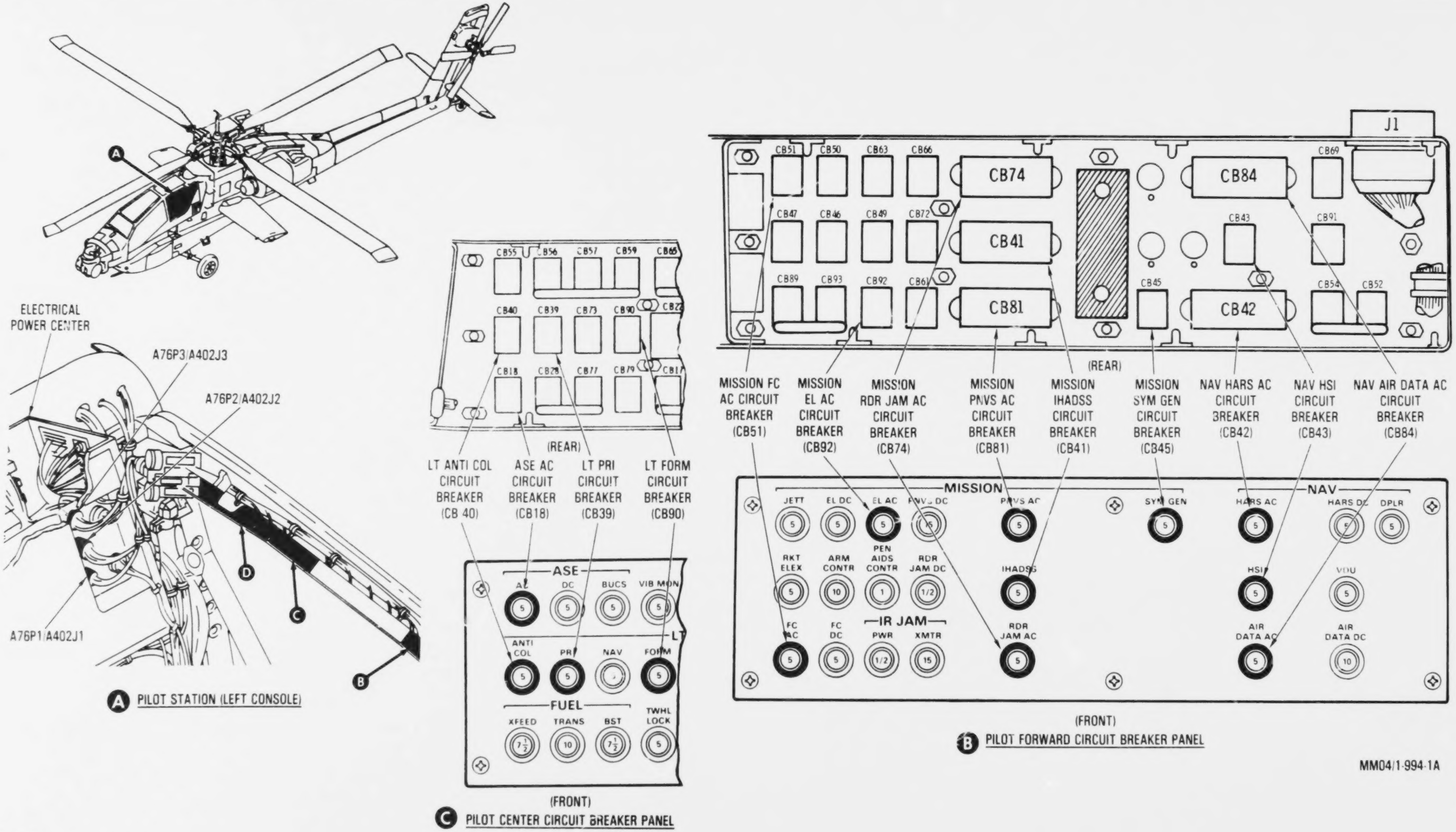


NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

SHEET 2 OF 2 MM04/1-757-2B

9-16-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

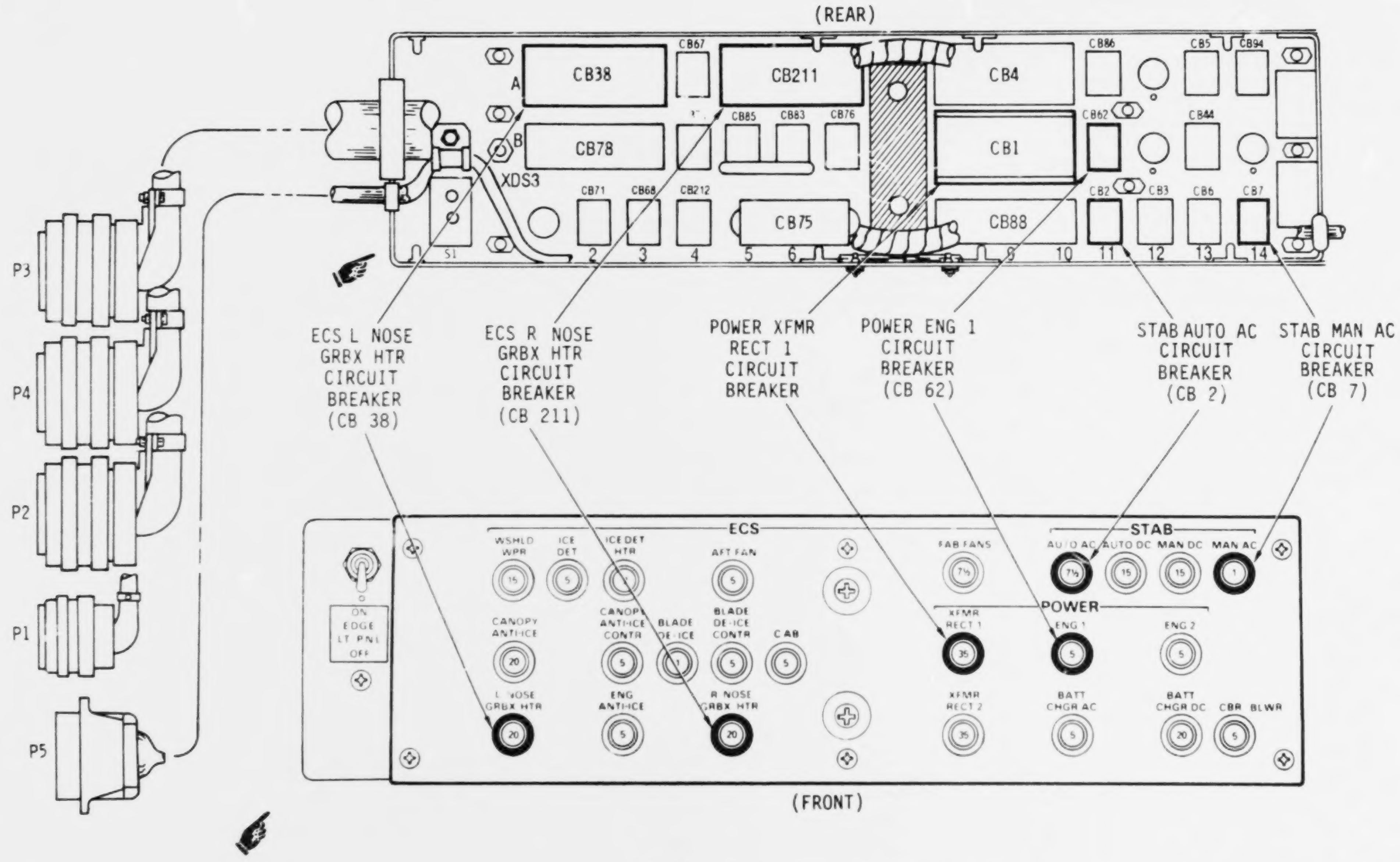


A PILOT STATION (LEFT CONSOLE)

B PILOT FORWARD CIRCUIT BREAKER PANEL

C PILOT CENTER CIRCUIT BREAKER PANEL

9-16-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



D PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-994-2F

9-16-4. A SHORT EXISTS BETWEEN GROUND AND A76P3-G -H, -J; A76P3-K, -L, -M or A76P3-N, -P, -R

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

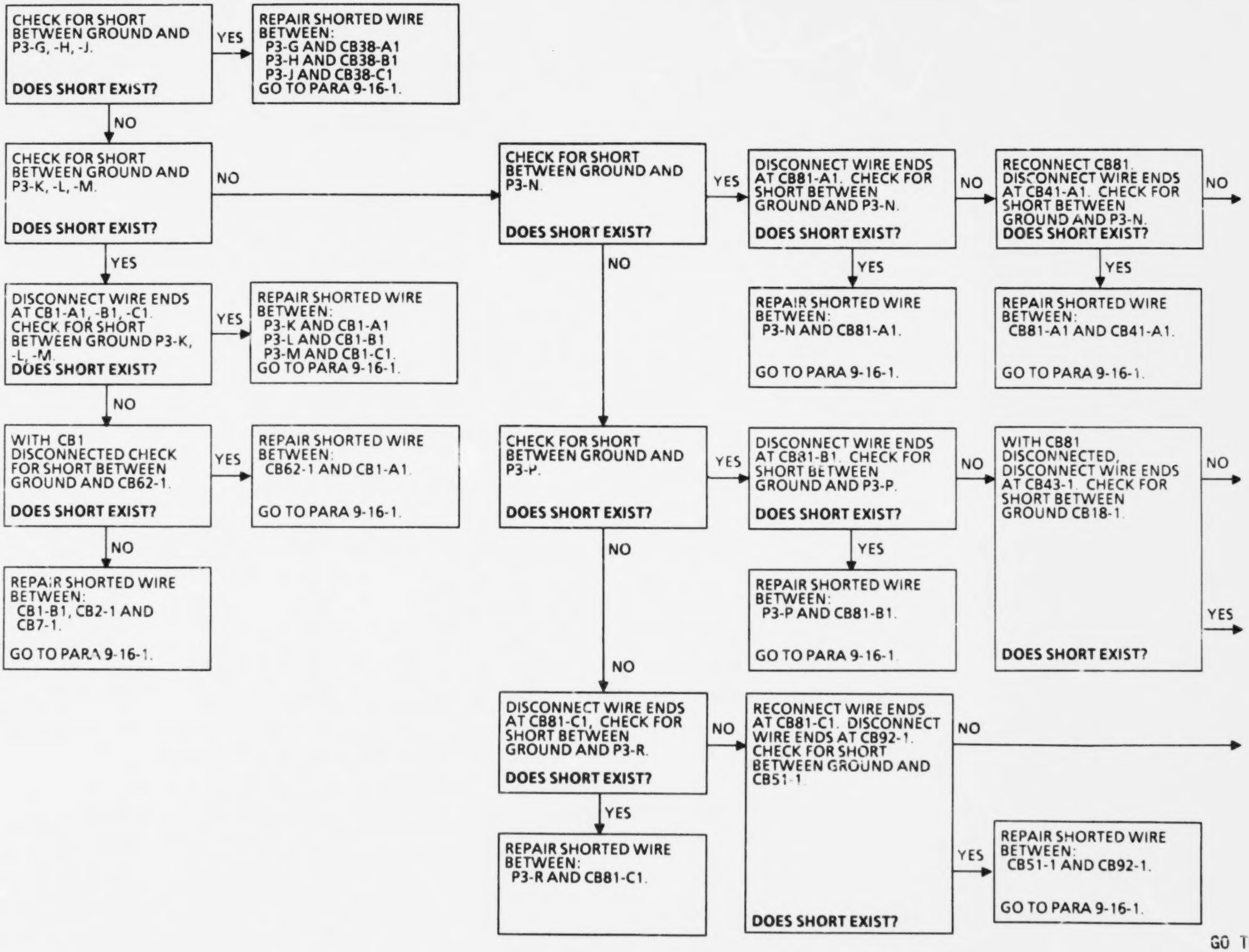
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

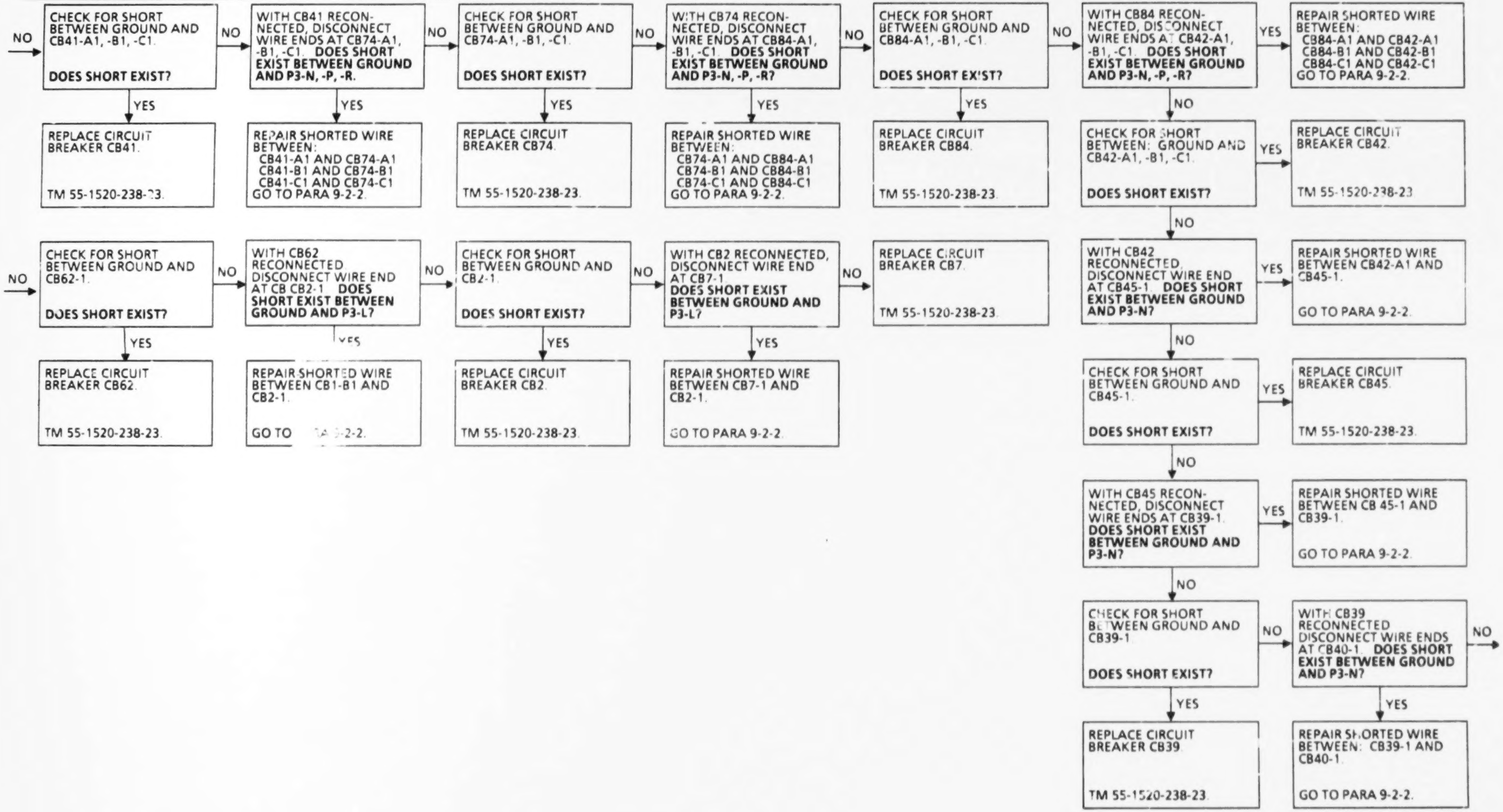
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-16-1	All pilot ac essential bus 1 circuit breakers open


CHECK FOR SHORT BETWEEN GROUND AND P3-G, -H, -J. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P3-G AND CB38-A1 P3-H AND CB38-B1 P3-J AND CB38-C1 GO TO PARA 9-16-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-K, -L, -M. DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB1-A1, -B1, -C1. CHECK FOR SHORT BETWEEN GROUND P3-K, -L, -M. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P3-K AND CB1-A1 P3-L AND CB1-B1 P3-M AND CB1-C1. GO TO PARA 9-16-1.
NO
WITH CB1 DISCONNECTED CHECK FOR SHORT BETWEEN GROUND AND CB62-1. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: CB62-1 AND CB1-A1. GO TO PARA 9-16-1.
NO
REPAIR SHORTED WIRE BETWEEN: CB1-B1, CB2-1 AND CB7-1. GO TO PARA 9-16-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-N. DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB81-A1. CHECK FOR SHORT BETWEEN GROUND AND P3-N. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P3-N AND CB81-A1. GO TO PARA 9-16-1.
NO
RECONNECT CB81. DISCONNECT WIRE ENDS AT CB41-A1. CHECK FOR SHORT BETWEEN GROUND AND P3-N. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: CB81-A1 AND CB41-A1. GO TO PARA 9-16-1.
NO
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-P. DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB81-B1. CHECK FOR SHORT BETWEEN GROUND AND P3-P. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P3-P AND CB81-B1. GO TO PARA 9-16-1.
NO
WITH CB81 DISCONNECTED, DISCONNECT WIRE ENDS AT CB43-1. CHECK FOR SHORT BETWEEN GROUND CB18-1. DOES SHORT EXIST?
NO
YES
NO
NO
DISCONNECT WIRE ENDS AT CB81-C1, CHECK FOR SHORT BETWEEN GROUND AND P3-R. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P3-R AND CB81-C1.
NO
RECONNECT WIRE ENDS AT CB81-C1. DISCONNECT WIRE ENDS AT CB92-1. CHECK FOR SHORT BETWEEN GROUND AND CB51-1. DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE BETWEEN: CB51-1 AND CB92-1. GO TO PARA 9-16-1.

GO TO NEXT PAGE

9-16-4. 115 VAC - IS NOT PRESENT AT A402J3-G, -H, -J; A402J3-K, -L, -M; OR A402J3-N, -P, -R (cont)



CHECK FOR SHORT BETWEEN GROUND AND CB41-A1, -B1, -C1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB41.

TM 55-1520-238-23.

WITH CB41 RECONNECTED, DISCONNECT WIRE ENDS AT CB74-A1, -B1, -C1. **DOES SHORT EXIST BETWEEN GROUND AND P3-N, -P, -R.**

REPAIR SHORTED WIRE BETWEEN:
CB41-A1 AND CB74-A1
CB41-B1 AND CB74-B1
CB41-C1 AND CB74-C1
GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB74-A1, -B1, -C1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB74.

TM 55-1520-238-23.

WITH CB74 RECONNECTED, DISCONNECT WIRE ENDS AT CB84-A1, -B1, -C1. **DOES SHORT EXIST BETWEEN GROUND AND P3-N, -P, -R?**

REPAIR SHORTED WIRE BETWEEN:
CB74-A1 AND CB84-A1
CB74-B1 AND CB84-B1
CB74-C1 AND CB84-C1
GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB84-A1, -B1, -C1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB84.

TM 55-1520-238-23.

WITH CB84 RECONNECTED, DISCONNECT WIRE ENDS AT CB42-A1, -B1, -C1. **DOES SHORT EXIST BETWEEN GROUND AND P3-N, -P, -R?**

REPAIR SHORTED WIRE BETWEEN:
CB84-A1 AND CB42-A1
CB84-B1 AND CB42-B1
CB84-C1 AND CB42-C1
GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN: GROUND AND CB42-A1, -B1, -C1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB42.

TM 55-1520-238-23

WITH CB42 RECONNECTED, DISCONNECT WIRE END AT CB45-1. **DOES SHORT EXIST BETWEEN GROUND AND P3-N?**

REPAIR SHORTED WIRE BETWEEN CB42-A1 AND CB45-1.

GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB45-1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB45.

TM 55-1520-238-23.

WITH CB45 RECONNECTED, DISCONNECT WIRE ENDS AT CB39-1. **DOES SHORT EXIST BETWEEN GROUND AND P3-N?**

REPAIR SHORTED WIRE BETWEEN CB 45-1 AND CB39-1.

GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB39-1

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB39.

TM 55-1520-238-23.

WITH CB39 RECONNECTED DISCONNECT WIRE ENDS AT CB40-1. **DOES SHORT EXIST BETWEEN GROUND AND P3-N?**

REPAIR SHORTED WIRE BETWEEN: CB39-1 AND CB40-1.

GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB62-1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB62.

TM 55-1520-238-23.

WITH CB62 RECONNECTED DISCONNECT WIRE END AT CB CB2-1. **DOES SHORT EXIST BETWEEN GROUND AND P3-L?**

REPAIR SHORTED WIRE BETWEEN CB1-B1 AND CB2-1.

GO TO PARA 9-2-2.

CHECK FOR SHORT BETWEEN GROUND AND CB2-1.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB2.

TM 55-1520-238-23.

WITH CB2 RECONNECTED, DISCONNECT WIRE END AT CB7-1. **DOES SHORT EXIST BETWEEN GROUND AND P3-L?**

REPAIR SHORTED WIRE BETWEEN CB7-1 AND CB2-1.

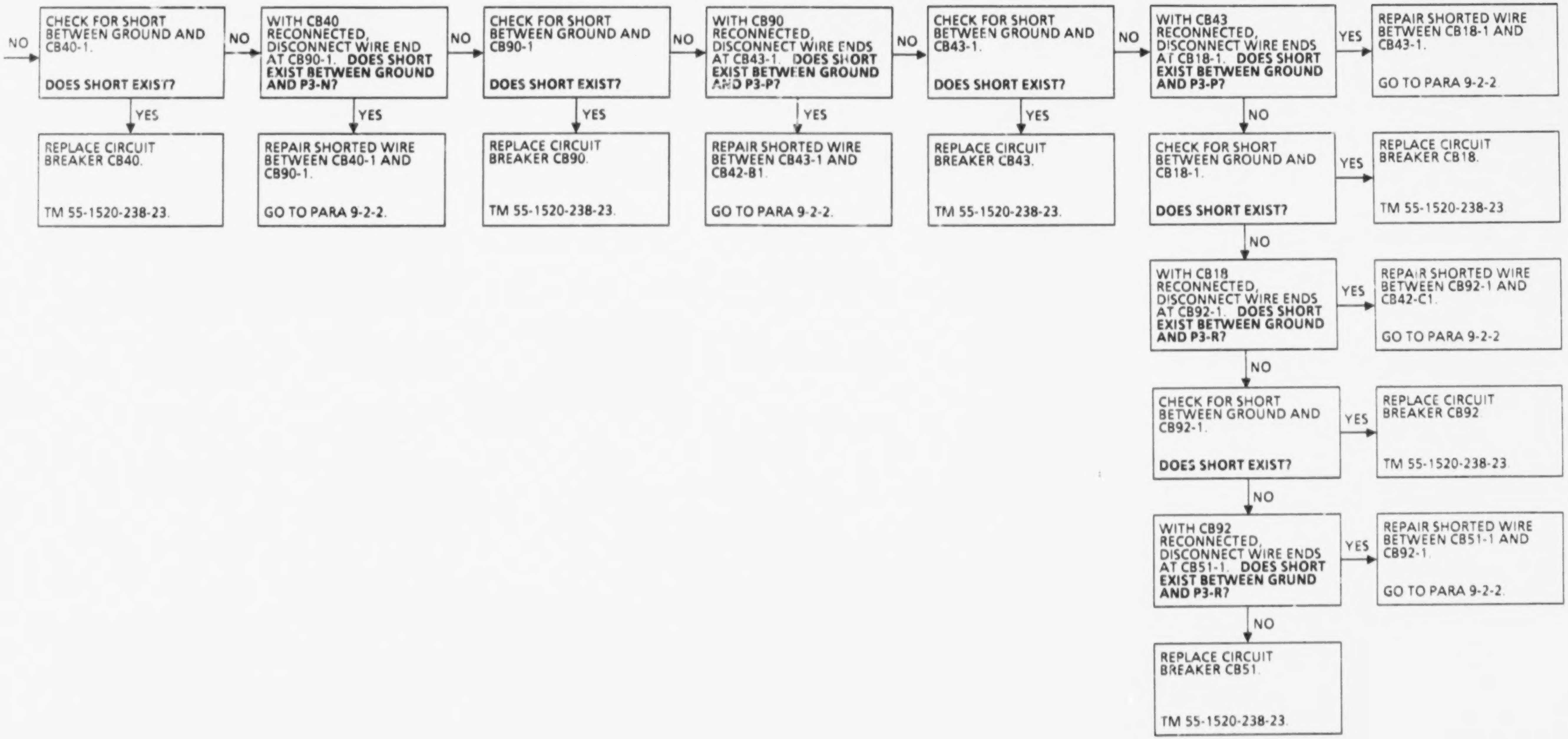
GO TO PARA 9-2-2.

REPLACE CIRCUIT BREAKER CB7.

TM 55-1520-238-23.

GO TO NEXT PAGE

9-16-4. 115 VAC - IS NOT PRESENT AT A402J3-G, -H, -J; A402J3-K, -L, -M; OR A402J3-N, -P, -R (cont)


NO
CHECK FOR SHORT BETWEEN GROUND AND CB40-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB40. TM 55-1520-238-23.
NO
WITH CB40 RECONNECTED, DISCONNECT WIRE END AT CB90-1. DOES SHORT EXIST BETWEEN GROUND AND P3-N?
YES
REPAIR SHORTED WIRE BETWEEN CB40-1 AND CB90-1. GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB90-1 DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB90. TM 55-1520-238-23.
NO
WITH CB90 RECONNECTED, DISCONNECT WIRE ENDS AT CB43-1. DOES SHORT EXIST BETWEEN GROUND AND P3-P?
YES
REPAIR SHORTED WIRE BETWEEN CB43-1 AND CB42-B1. GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB43-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB43. TM 55-1520-238-23.
NO
WITH CB43 RECONNECTED, DISCONNECT WIRE ENDS AT CB18-1. DOES SHORT EXIST BETWEEN GROUND AND P3-P?
YES
REPAIR SHORTED WIRE BETWEEN CB18-1 AND CB43-1. GO TO PARA 9-2-2
NO
CHECK FOR SHORT BETWEEN GROUND AND CB18-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23
NO
WITH CB18 RECONNECTED, DISCONNECT WIRE ENDS AT CB92-1. DOES SHORT EXIST BETWEEN GROUND AND P3-R?
YES
REPAIR SHORTED WIRE BETWEEN CB92-1 AND CB42-C1. GO TO PARA 9-2-2
NO
CHECK FOR SHORT BETWEEN GROUND AND CB92-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB92. TM 55-1520-238-23.
NO
WITH CB92 RECONNECTED, DISCONNECT WIRE ENDS AT CB51-1. DOES SHORT EXIST BETWEEN GRUND AND P3-R?
YES
REPAIR SHORTED WIRE BETWEEN CB51-1 AND CB92-1. GO TO PARA 9-2-2.
NO
REPLACE CIRCUIT BREAKER CB51. TM 55-1520-238-23.

END OF TASK

9-16-5. MISSION PNVS AC CIRCUIT BREAKER (CB81) - DOES NOT STAY CLOSED OR 115 VAC TO PNVS IS NOT PRESENT AT A76P2-N, -P, -R

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

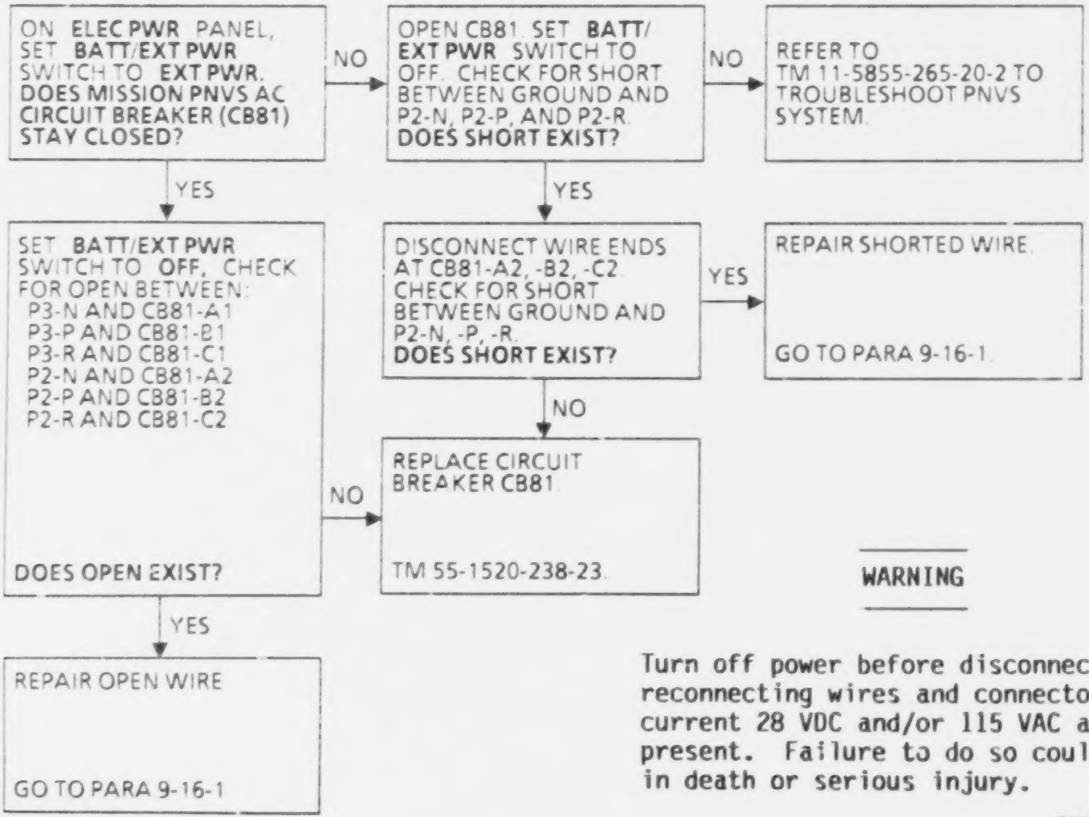
References:

TM 55-1520-238-23
TM 11-5855-265-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES MISSION PNVS AC CIRCUIT BREAKER (CB81) STAY CLOSED?**

OPEN CB81. SET **BATT/EXT PWR** SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-N, P2-P, AND P2-R. **DOES SHORT EXIST?**

REFER TO TM 11-5855-265-20-2 TO TROUBLESHOOT PNVS SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
P3-N AND CB81-A1
P3-P AND CB81-B1
P3-R AND CB81-C1
P2-N AND CB81-A2
P2-P AND CB81-B2
P2-R AND CB81-C2
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB81-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-N, -P, -R. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE. GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB81. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-16-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-6. MISSION IHADSS CIRCUIT BREAKER (CB41) - DOES NOT STAY CLOSED OR 115 VAC TO IHADSS IS NOT PRESENT AT A76P1-11, -12, -13

9-16-5/9-16-6

Tools: (para 9-16-5)

Personnel Required: (para 9-16-5)

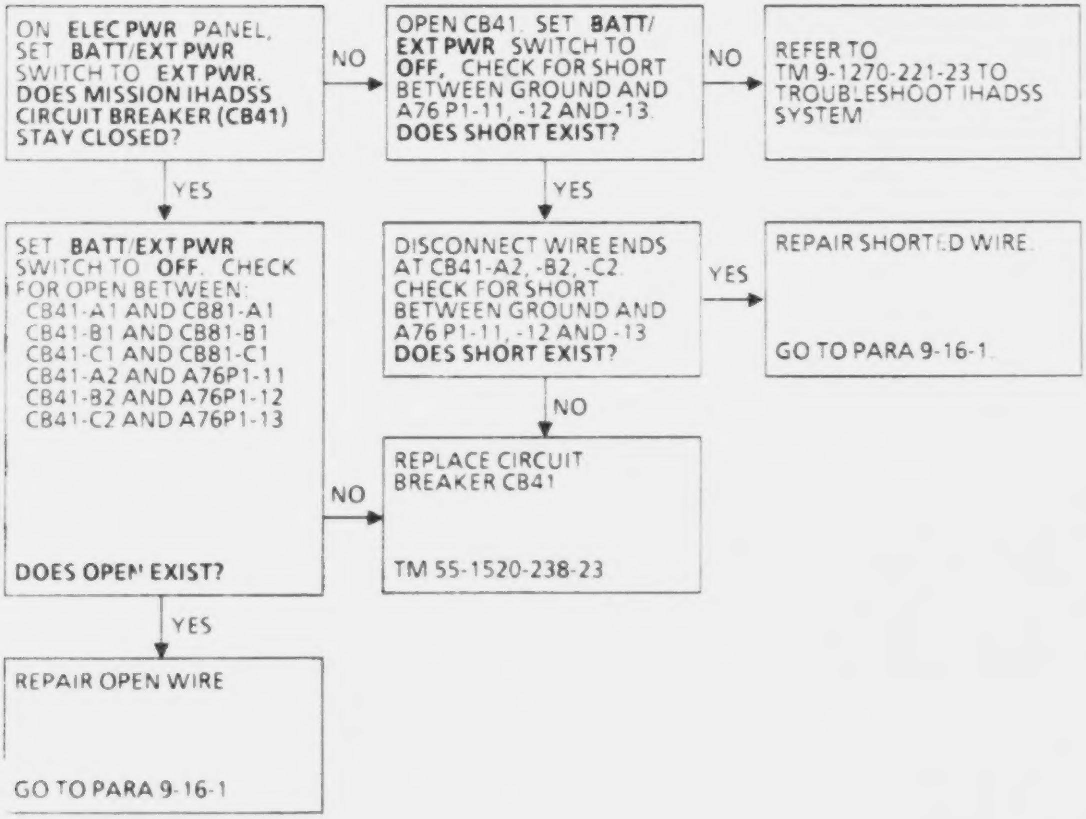
References:

TM 55-1520-238-23
TM 9-1270-221-23

Equipment Conditions: (para 9-16-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MISSION IHADSS CIRCUIT BREAKER (CB41) STAY CLOSED?**

OPEN CB41. SET **BATT/ EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-11, -12 AND -13. **DOES SHORT EXIST?**

REFER TO TM 9-1270-221-23 TO TROUBLESHOOT IHADSS SYSTEM

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB41-A1 AND CB81-A1
CB41-B1 AND CB81-B1
CB41-C1 AND CB81-C1
CB41-A2 AND A76P1-11
CB41-B2 AND A76P1-12
CB41-C2 AND A76P1-13
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB41-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-11, -12 AND -13 **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.
GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB41
TM 55-1520-238-23

REPAIR OPEN WIRE
GO TO PARA 9-16-1

END OF TASK

9-16-7. MISSION RDR JAM AC CIRCUIT BREAKER (CB74) - DOES NOT STAY CLOSED OR 115 VAC TO RADAR JAMMER IS NOT PRESENT AT A76P1-5, -6, -7

Tools:

Nomenclature	Part Number (*SN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

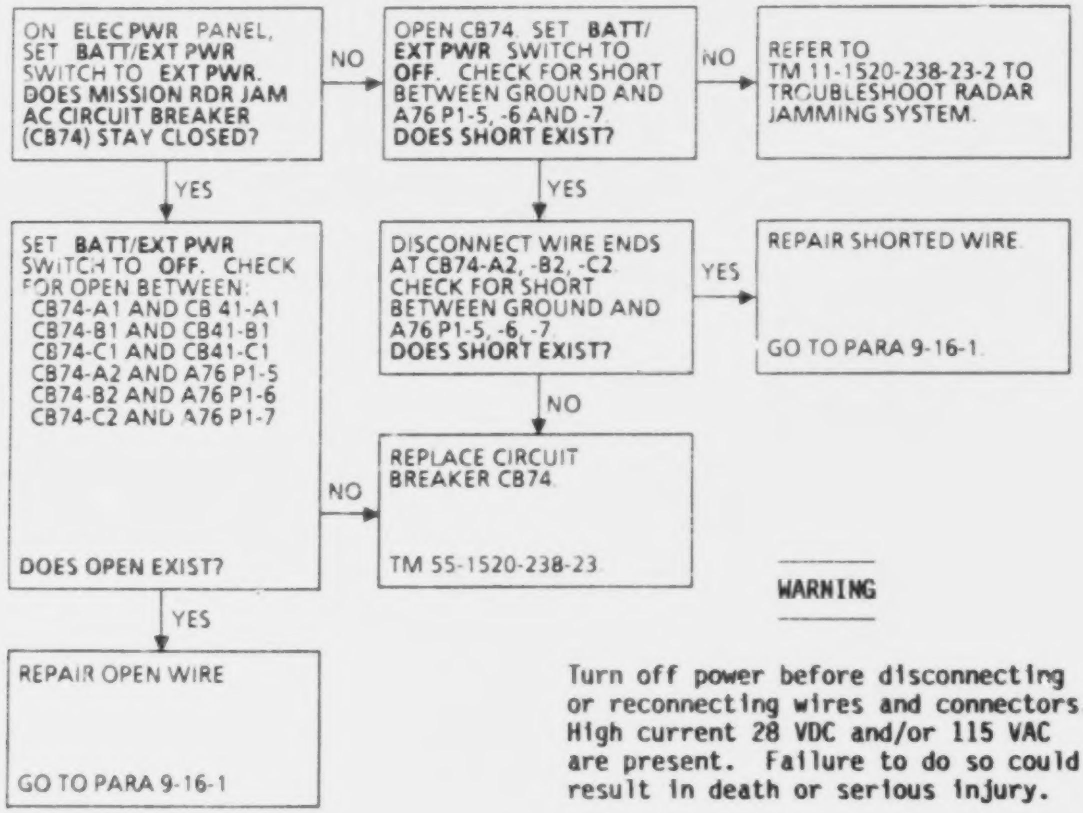
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES MISSION RDR JAM AC CIRCUIT BREAKER (CB74) STAY CLOSED?**

OPEN CB74. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-5, -6 AND -7. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR JAMMING SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB74-A1 AND CB 41-A1
CB74-B1 AND CB41-B1
CB74-C1 AND CB41-C1
CB74-A2 AND A76 P1-5
CB74-B2 AND A76 P1-6
CB74-C2 AND A76 P1-7
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB74-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76 P1-5, -6, -7. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.
GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB74.
TM 55-1520-238-23.

REPAIR OPEN WIRE
GO TO PARA 9-16-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-8. NAV AIR DATA AC CIRCUIT BREAKER (CB84) - DOES NOT STAY CLOSED OR 115 VAC TO OAS IS NOT PRESENT AT A76P2-H, -G, -F

Tools: (para 9-16-7)

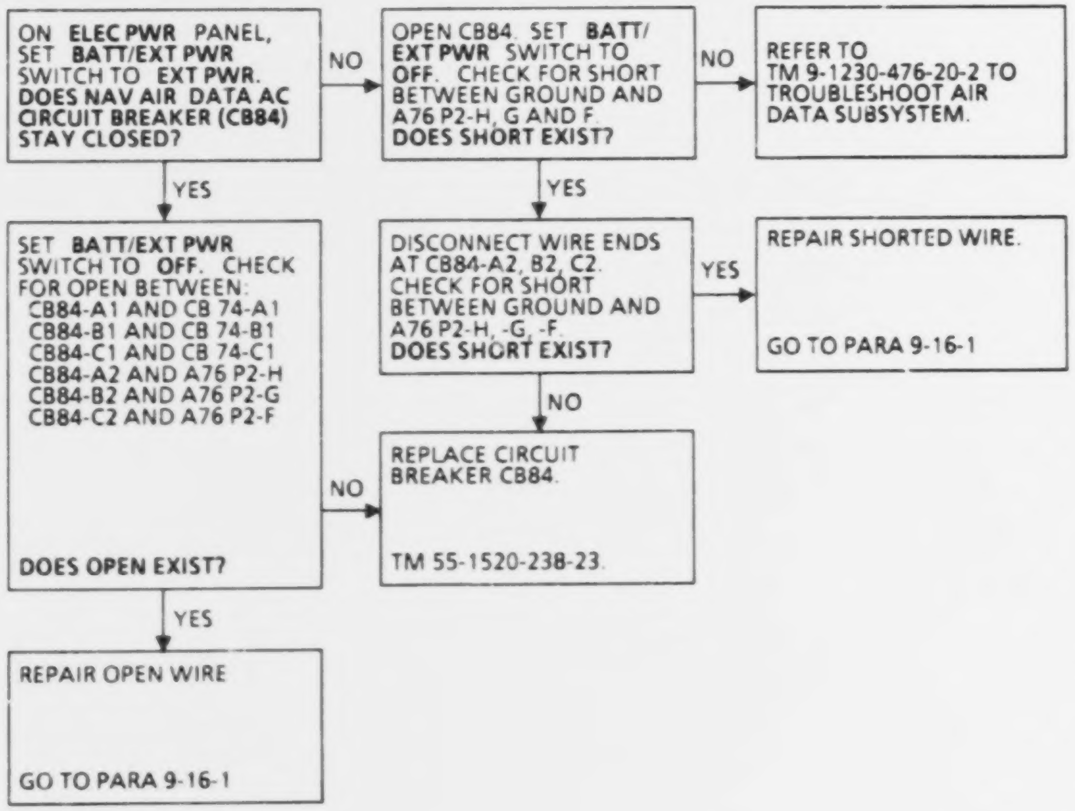
Personnel Required: (para 9-16-7)

References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-16-7)

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES NAV AIR DATA AC CIRCUIT BREAKER (CB84) STAY CLOSED?**

OPEN CB84. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76 P2-H, G AND F. **DOES SHORT EXIST?**

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT AIR DATA SUBSYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB84-A1 AND CB 74-A1
CB84-B1 AND CB 74-B1
CB84-C1 AND CB 74-C1
CB84-A2 AND A76 P2-H
CB84-B2 AND A76 P2-G
CB84-C2 AND A76 P2-F
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB84-A2, B2, C2. CHECK FOR SHORT BETWEEN GROUND AND A76 P2-H, -G, -F. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.
GO TO PARA 9-16-1

REPLACE CIRCUIT BREAKER CB84.
TM 55-1520-238-23.

REPAIR OPEN WIRE
GO TO PARA 9-16-1

END OF TASK

9-16-9. NAV HARS AC CIRCUIT BREAKER (CB42) - DOES NOT STAY CLOSED OR 115 VAC TO HARS IS NOT PRESENT AT A76P1-38, -39, -40

Tools: (para 9-16-7)

Personnel Required: (para 9-16-7)

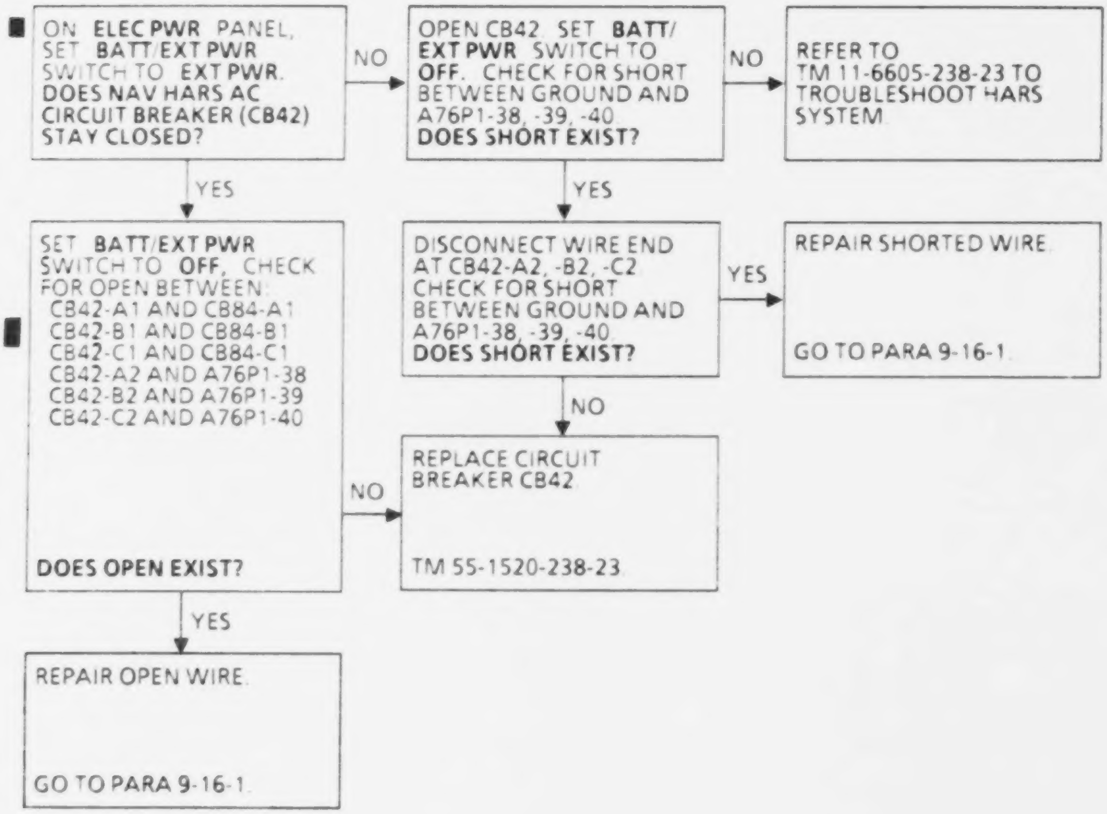
References:

TM 55-1520-238-23
TM 11-6605-238-23

Equipment Conditions: (para 9-16-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV HARS AC CIRCUIT BREAKER (CB42) STAY CLOSED?
NO
OPEN CB42. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-38, -39, -40. DOES SHORT EXIST?
NO
REFER TO TM 11-6605-238-23 TO TROUBLESHOOT HARS SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB42-A1 AND CB84-A1 CB42-B1 AND CB84-B1 CB42-C1 AND CB84-C1 CB42-A2 AND A76P1-38 CB42-B2 AND A76P1-39 CB42-C2 AND A76P1-40 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB42-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-38, -39, -40. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-16-1.
NO
NO
REPLACE CIRCUIT BREAKER CB42. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-10. MISSION SYM GEN CIRCUIT BREAKER (CB45) - DOES NOT STAY CLOSED OR 115 VAC TO SYMBOL GENERATOR IS NOT PRESENT AT A76P1-52

9-16-9/9-16-10

Tools: (para 9-16-7)

Personnel Required: (para 9-16-7)

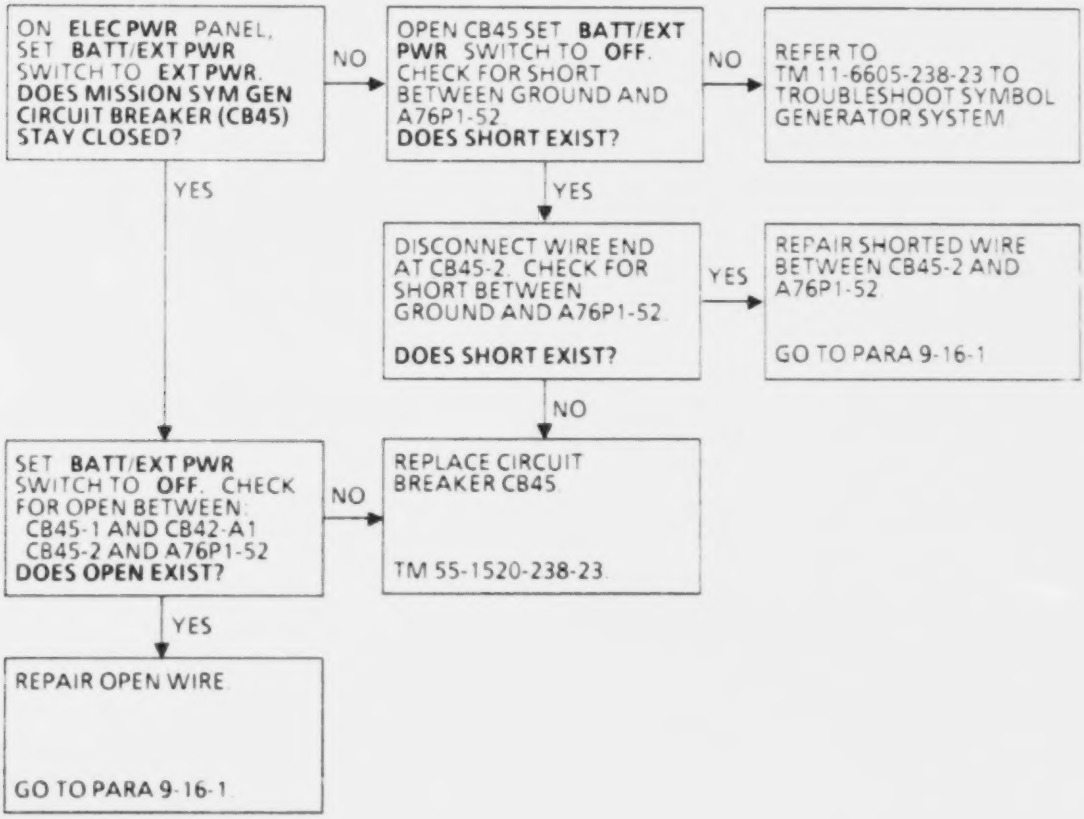
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-16-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MISSION SYM GEN CIRCUIT BREAKER (CB45) STAY CLOSED?**

OPEN CB45 SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-52. **DOES SHORT EXIST?**

REFER TO TM 11-6605-238-23 TO TROUBLESHOOT SYMBOL GENERATOR SYSTEM.

DISCONNECT WIRE END AT CB45-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-52.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB45-2 AND A76P1-52.

GO TO PARA 9-16-1

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB45-1 AND CB42-A1
CB45-2 AND A76P1-52
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB45.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.

END OF TASK

9-16-11. LT PRI CIRCUIT BREAKER (CB39) - DOES NOT STAY CLOSED OR 115 VAC TO MULTI-CHANNEL DIMMING CONTROLLER - IS NOT PRESENT AT A76P1-45

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

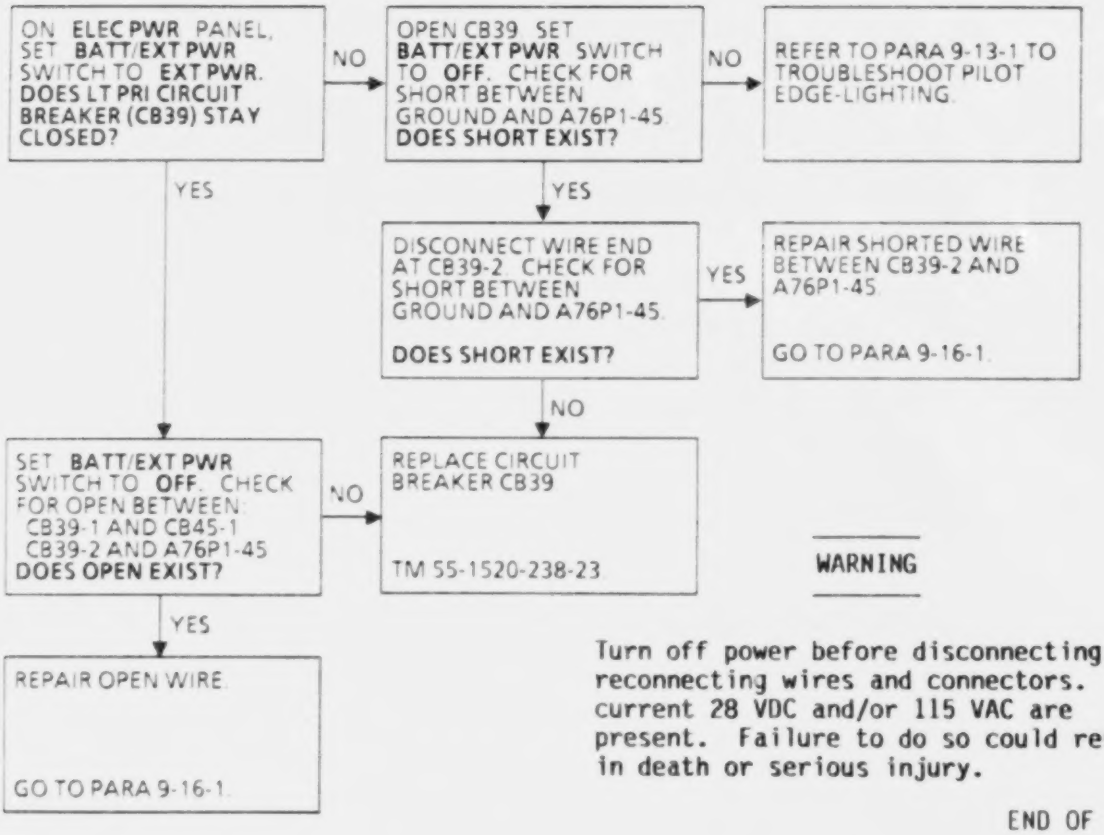
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT PRI CIRCUIT BREAKER (CB39) STAY CLOSED?
NO
OPEN CB39. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-45. DOES SHORT EXIST?
NO
REFER TO PARA 9-13-1 TO TROUBLESHOOT PILOT EDGE-LIGHTING.
YES
YES
DISCONNECT WIRE END AT CB39-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-45. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB39-2 AND A76P1-45. GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB39-1 AND CB45-1 CB39-2 AND A76P1-45 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB39 TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-12. LT ANTI COL CIRCUIT BREAKER (CB40) - DOES NOT STAY CLOSED OR 115 VAC TO ANTI COLLISION LIGHTS IS NOT PRESENT AT A76P1-44

Tools: (para 9-16-11)

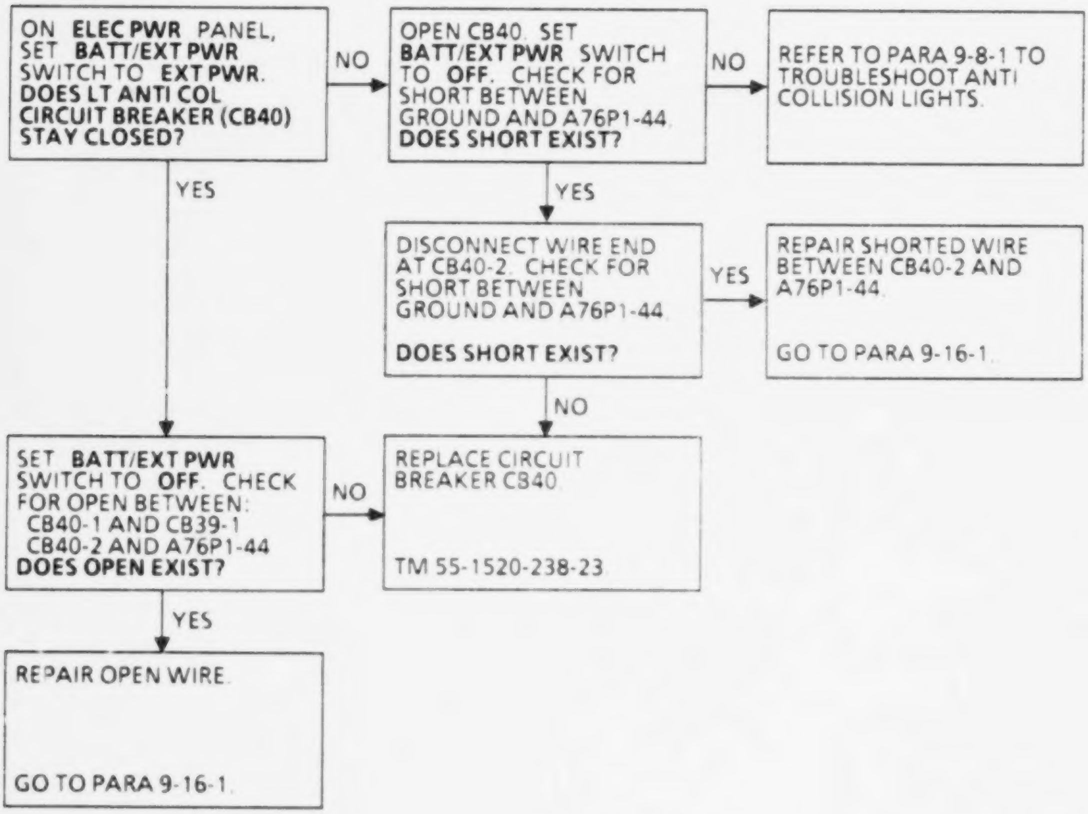
Personnel Required: (para 9-16-11)

References: (para 9-16-11)

Equipment Conditions: (para 9-16-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT ANTI COL CIRCUIT BREAKER (CB40) STAY CLOSED?
NO
OPEN CB40. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-44. DOES SHORT EXIST?
NO
REFER TO PARA 9-8-1 TO TROUBLESHOOT ANTI COLLISION LIGHTS.
YES
YES
DISCONNECT WIRE END AT CB40-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-44. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB40-2 AND A76P1-44. GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB40-1 AND CB39-1 CB40-2 AND A76P1-44 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB40. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-13. LT FORM CIRCUIT BREAKER (CB90) - DOES NOT STAY CLOSED OR 115 VAC TO FORMATION LIGHTS IS NOT PRESENT AT A76P1-24

Tools: (para 9-16-11)

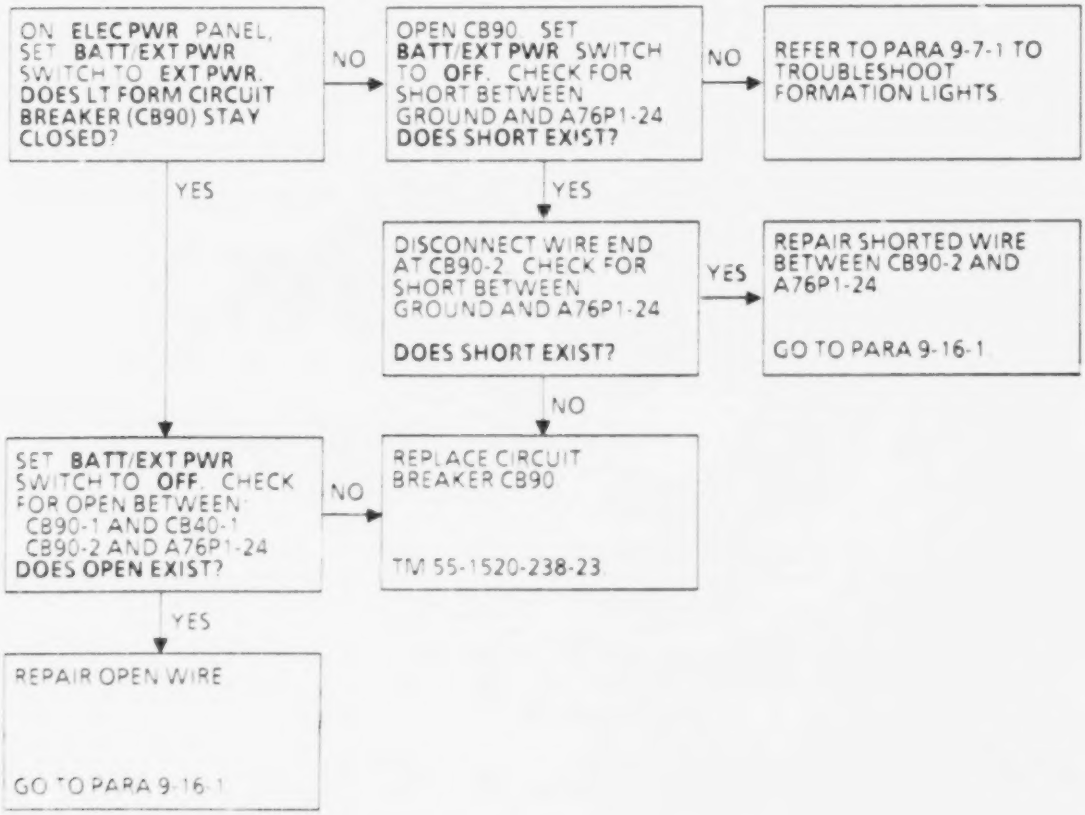
Personnel Required: (para 9-16-11)

References: (para 9-16-11)

Equipment Conditions: (para 9-16-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT FORM CIRCUIT BREAKER (CB90) STAY CLOSED?
NO
OPEN CB90. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-24. DOES SHORT EXIST?
NO
REFER TO PARA 9-7-1 TO TROUBLESHOOT FORMATION LIGHTS.
YES
YES
DISCONNECT WIRE END AT CB90-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-24.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB90-2 AND A76P1-24
GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB90-1 AND CB40-1 CB90-2 AND A76P1-24 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB90.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE
GO TO PARA 9-16-1.

END OF TASK

9-16-14. NAV HSI CIRCUIT BREAKER (CB43) - DOES NOT STAY CLOSED OR 115 VAC TO HORIZONTAL SITUATION INDICATOR IS NOT PRESENT AT A76P1-26

Tools: (para 9-16-11)

Personnel Required: (para 9-16-11)

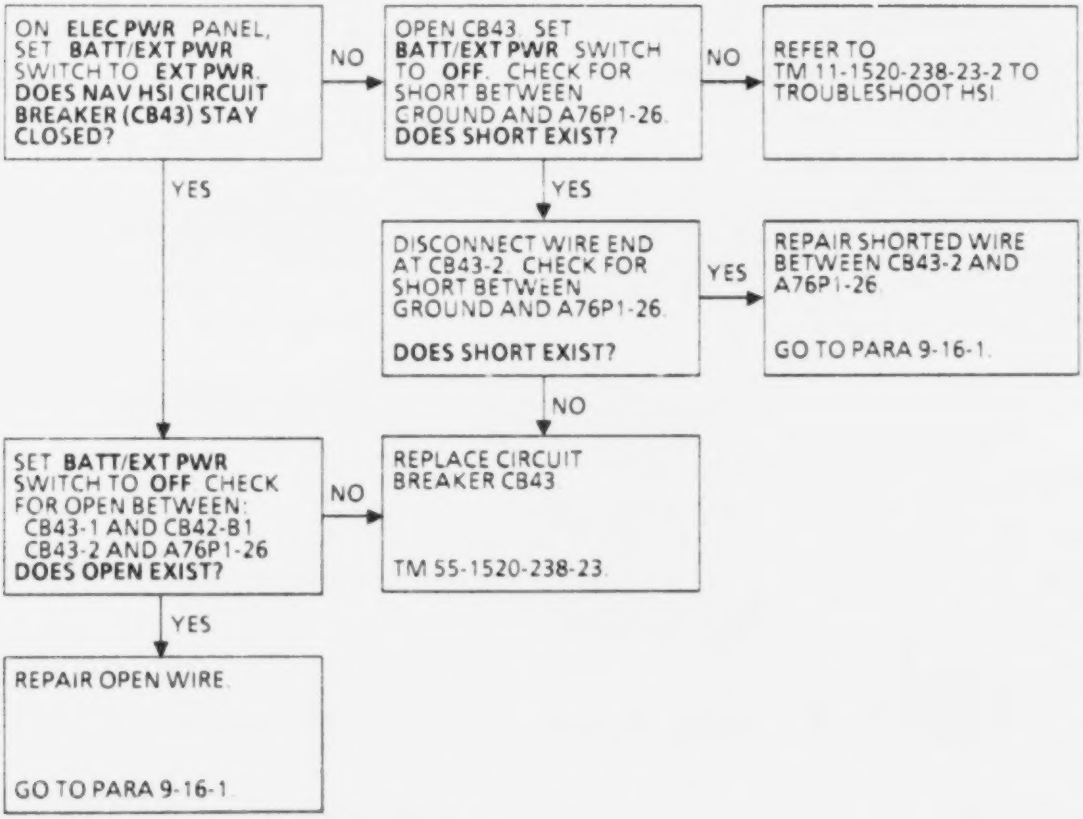
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-16-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV HSI CIRCUIT BREAKER (CB43) STAY CLOSED?
NO
OPEN CB43. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-26. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT HSI.
YES
YES
DISCONNECT WIRE END AT CB43-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-26. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB43-2 AND A76P1-26. GO TO PARA 9-16-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB43-1 AND CB42-B1 CB43-2 AND A76P1-26 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB43. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-16-1.

END OF TASK

9-16-15. ASE AC CIRCUIT BREAKER (CB18) - DOES NOT STAY CLOSED OR 115 VAC TO ASE ACTUATORS IS NOT PRESENT AT A76P1-54

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

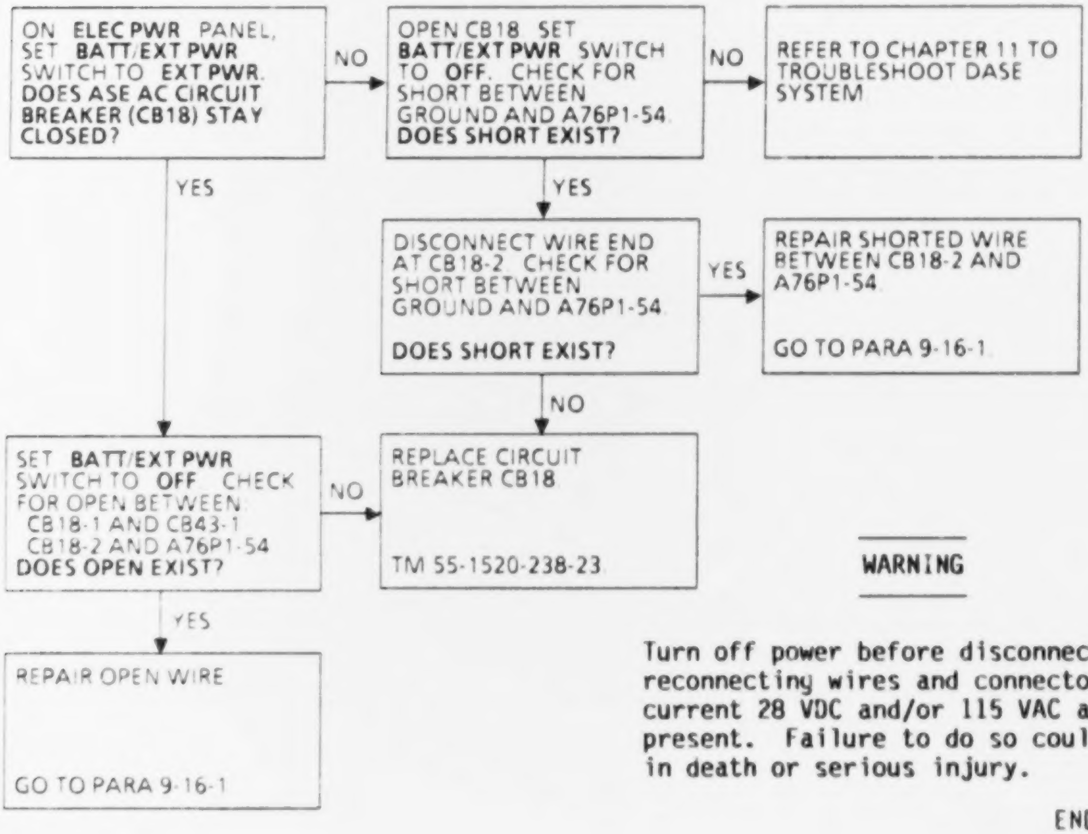
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES ASE AC CIRCUIT BREAKER (CB18) STAY CLOSED?**

OPEN CB18. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-54. **DOES SHORT EXIST?**

REFER TO CHAPTER 11 TO TROUBLESHOOT DASE SYSTEM.

DISCONNECT WIRE END AT CB18-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-54.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB18-2 AND A76P1-54.

GO TO PARA 9-16-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB18-1 AND CB43-1
CB18-2 AND A76P1-54
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB18.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-16. MISSION EL AC CIRCUIT BREAKER (CB92) - DOES NOT STAY CLOSED OR 115 VAC TO STORES ELEVATION CONTROLLER IS NOT PRESENT AT 76P1-30

Tools: (para 9-16-15)

Personnel Required: (para 9-16-15)

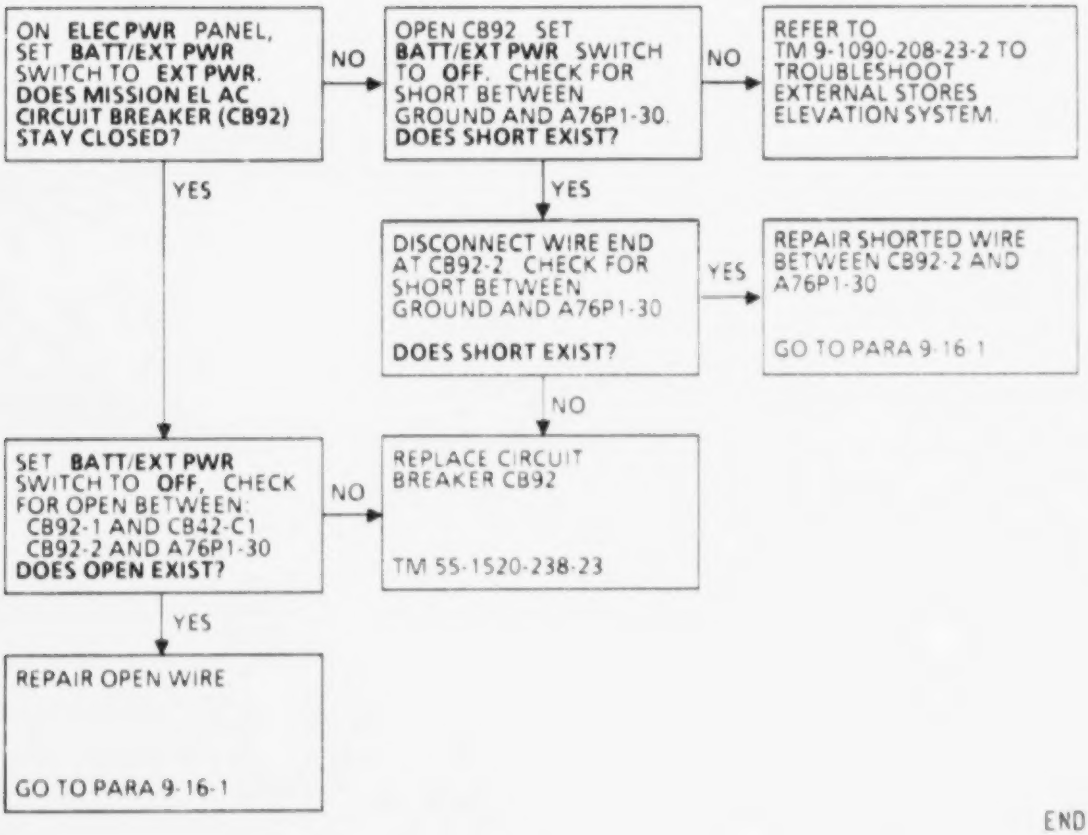
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions: (para 9-16-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION EL AC CIRCUIT BREAKER (CB92) STAY CLOSED?
NO
OPEN CB92. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-30. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT EXTERNAL STORES ELEVATION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB92-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-30
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB92-2 AND A76P1-30
GO TO PARA 9-16-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB92-1 AND CB42-C1 CB92-2 AND A76P1-30 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB92
TM 55-1520-238-23
YES
REPAIR OPEN WIRE
GO TO PARA 9-16-1

END OF TA

9-16-17. MISSION FC AC CIRCUIT BREAKER (CB51) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P1-28

Tools: (para 9-16-15)

Personnel Required: (para 9-16-15)

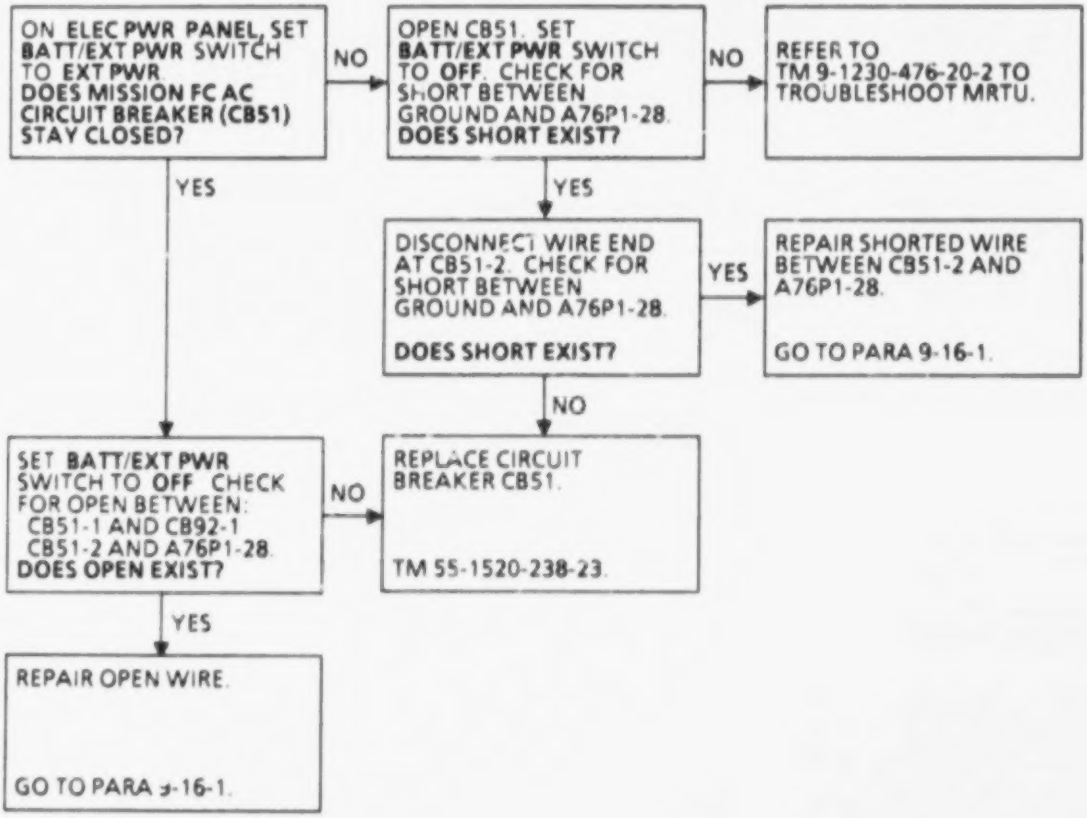
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-16-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MISSION FC AC CIRCUIT BREAKER (CB51) STAY CLOSED?**

OPEN CB51. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-28. **DOES SHORT EXIST?**

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

DISCONNECT WIRE END AT CB51-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-28.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB51-2 AND A76P1-28.

GO TO PARA 9-16-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB51-1 AND CB92-1
CB51-2 AND A76P1-28.
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB51.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.

END OF TASK

9-16-18. ECS L NOSE GRBX HTR CIRCUIT BREAKER (CB38) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P2-m, -n, -p

Tools: (para 9-16-15)

Personnel Required: (para 9-16-15)

References: (para 9-16-15)

Equipment Conditions: (para 9-16-15)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES ECS L NOSE GRBX HTR CIRCUIT BREAKER (CB38) STAY CLOSED?**

NO

SET **BATT/EXT PWR** SWITCH TO **OFF**. OPEN CB38. CHECK FOR SHORT BETWEEN GROUND AND A76P2-m, -n, -p. **DOES SHORT EXIST?**

NO

REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

YES

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:

CB38-A1 AND A76P3-G
CB38-B1 AND A76P3-H
CB38-C1 AND A76P3-J
CB38-A2 AND A76P2-m
CB38-B2 AND A76P2-n
CB38-C2 AND A76P2-p.

DOES OPEN EXIST?

YES

DISCONNECT WIRE ENDS AT CB38-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-m, -n, -p. **DOES SHORT EXIST?**

YES

REPAIR SHORTED WIRE.

GO TO PARA 9-16-1.

NO

REPLACE CIRCUIT BREAKER CB38.

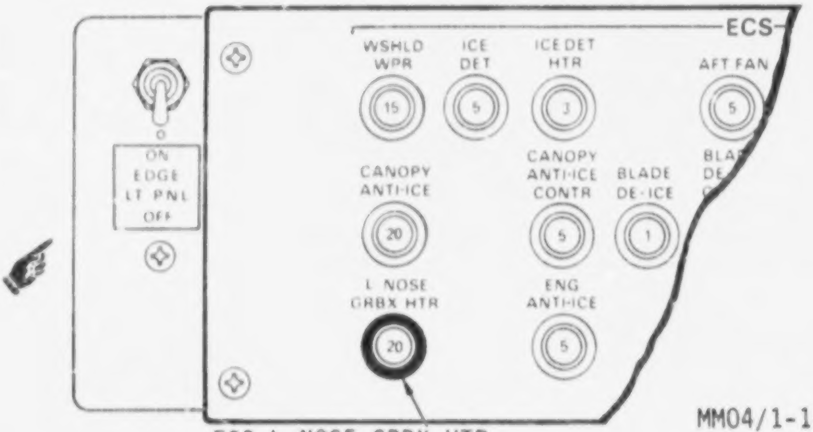
TM 55-1502-238-23.

NO

YES

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.



MM04/1-1567B

PILOT AFT CIRCUIT BREAKER PANEL

END OF TASK

9-16-19. POWER XFMR RECT 1 CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED OR CONTINUITY TO TRANSFORMER RECTIFIER NO. 1 DOES NOT EXIST BETWEEN A76P3-K AND -S; -L AND -T; -M AND -U

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

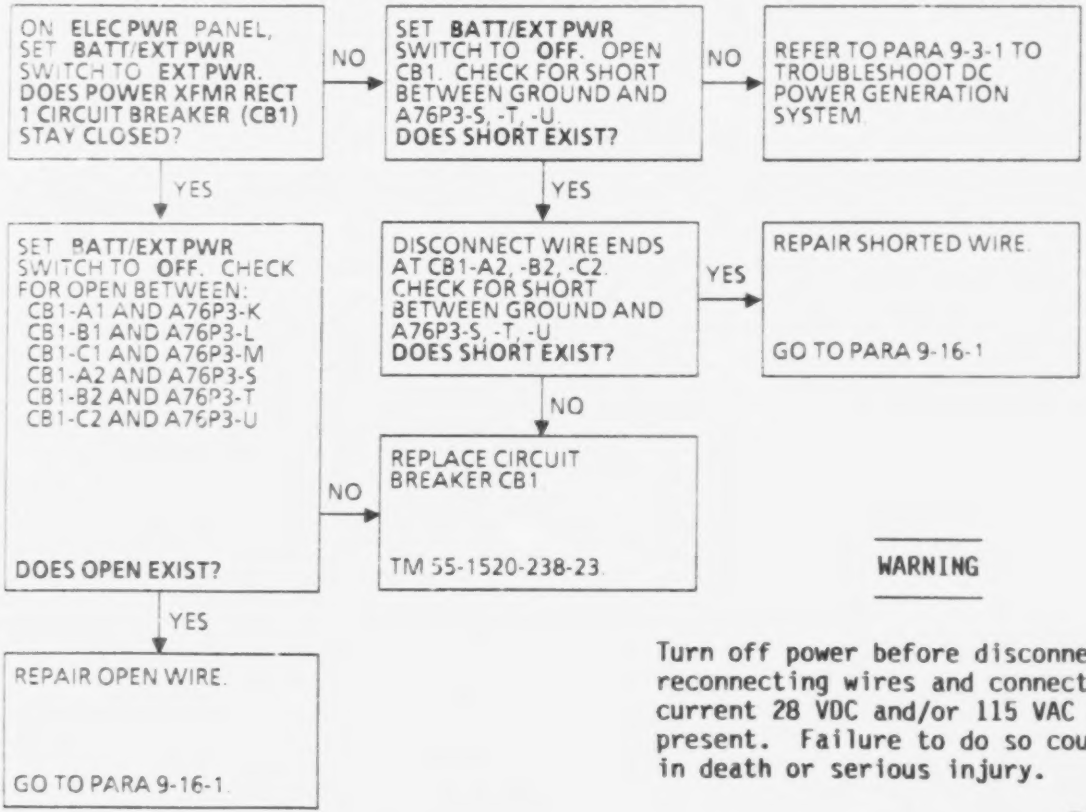
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Condition:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. DOES POWER XFMR RECT 1 CIRCUIT BREAKER (CB1) STAY CLOSED?

SET **BATT/EXT PWR** SWITCH TO **OFF**. OPEN CB1. CHECK FOR SHORT BETWEEN GROUND AND A76P3-S, -T, -U. **DOES SHORT EXIST?**

REFER TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB1-A1 AND A76P3-K
CB1-B1 AND A76P3-L
CB1-C1 AND A76P3-M
CB1-A2 AND A76P3-S
CB1-B2 AND A76P3-T
CB1-C2 AND A76P3-U
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB1-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P3-S, -T, -U. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.
GO TO PARA 9-16-1

REPLACE CIRCUIT BREAKER CB1
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-16-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-16-20. POWER ENG 1 CIRCUIT BREAKER (CB62) - DOES NOT STAY CLOSED OR 115 VAC TO ENGINE 1 POWER TRNASFORMER IS NOT PRESENT AT 76P1-22

Tools: (para 9-16-19)

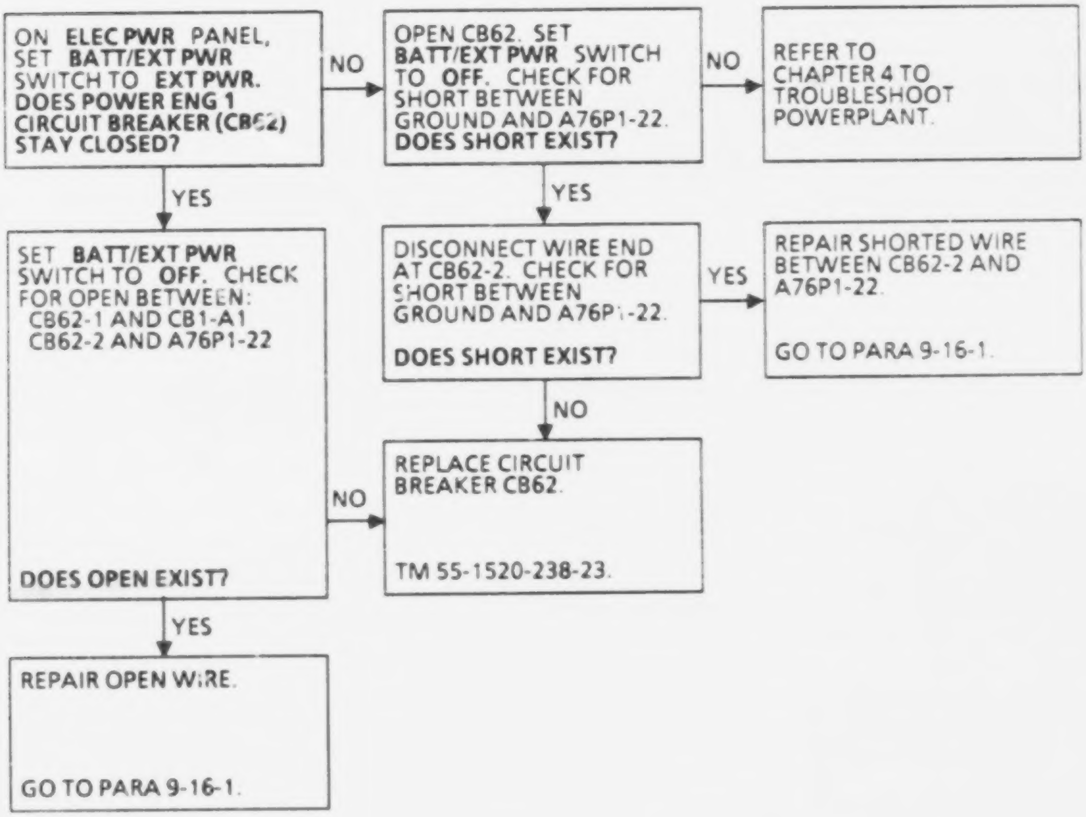
Personnel Required: (para 9-16-19)

References: (para 9-16-19)

Equipment Conditions: (para 9-16-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** **DOES POWER ENG 1 CIRCUIT BREAKER (CB62) STAY CLOSED?**

OPEN CB62. SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76P1-22. **DOES SHORT EXIST?**

REFER TO CHAPTER 4 TO TROUBLESHOOT POWERPLANT.

SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR OPEN BETWEEN:
CB62-1 AND CB1-A1
CB62-2 AND A76P1-22

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB62-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-22.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB62-2 AND A76P1-22.

GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB62.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.

END OF TASK

9-16-21. STAB MAN AC CIRCUIT BREAKER (CB7) - DOES NOT STAY CLOSED OR 115 VAC TO STABILATOR CONTROL UNIT IS NOT PRESENT AT P76P1-36

Tools: (para 9-16-19)

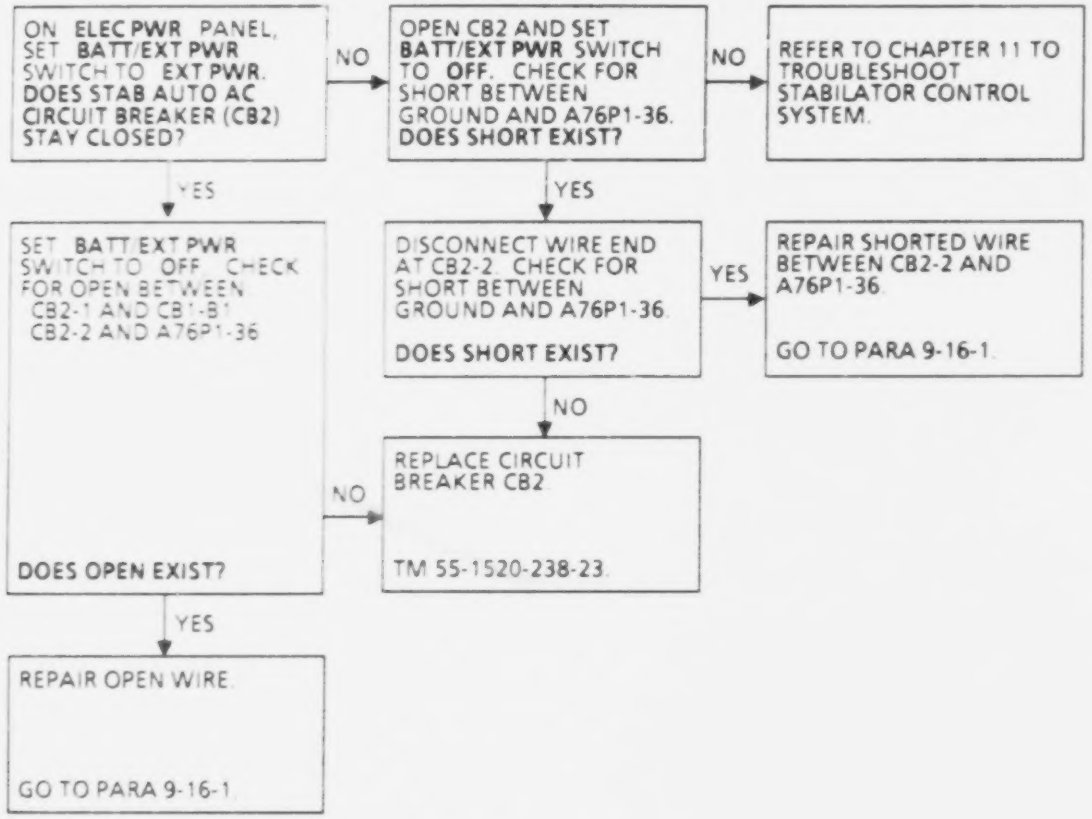
Personnel Required:

References: (para 9-16-19)

Equipment Conditions: (para 9-16-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connecto. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES STAB AUTO AC CIRCUIT BREAKER (CB2) STAY CLOSED?**

OPEN CB2 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-36. **DOES SHORT EXIST?**

REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB2-1 AND CB1-B1
CB2-2 AND A76P1-36

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB2-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-36.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB2-2 AND A76P1-36.

GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB2.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.

END OF TASK

9-16-22. STAB MAN AC CIRCUIT BREAKER (CB7) - DOES NOT STAY CLOSED OR 115 VAC TO STABILATOR POSITION INDICATOR IS NOT PRESENT AT P76P1-37

Tools: (para 9-16-19)

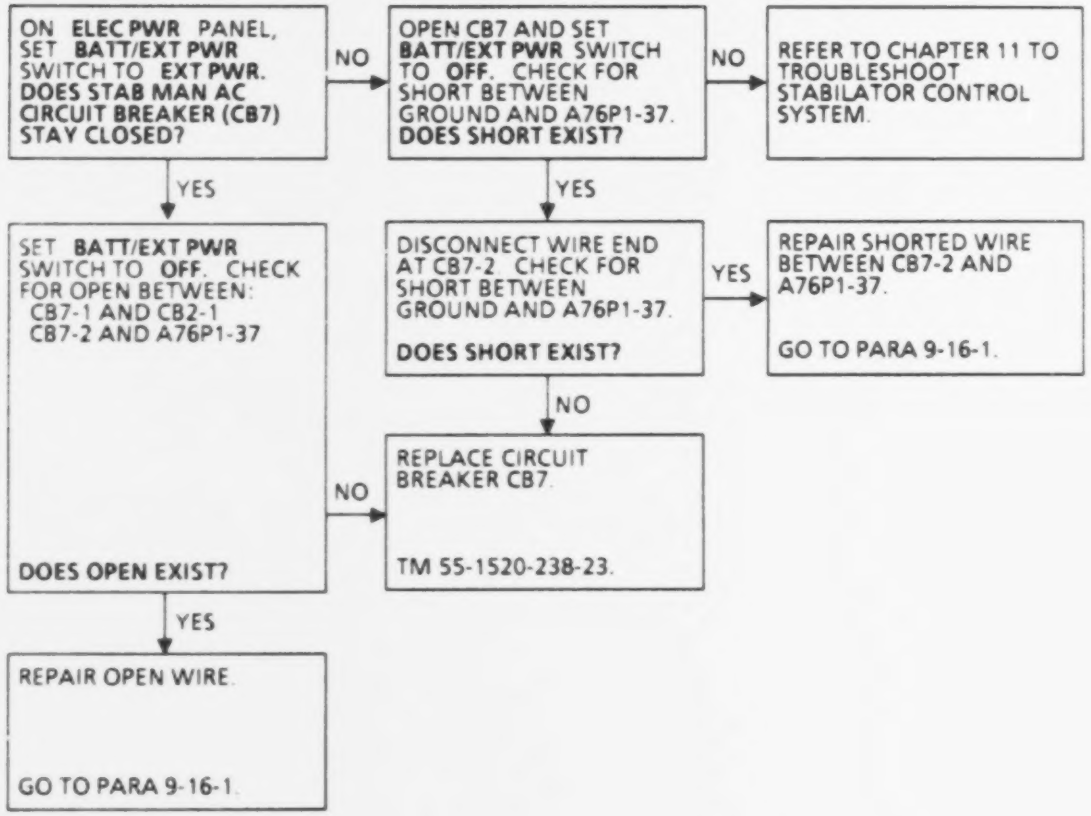
Personnel Required:

References: (para 9-16-19)

Equipment Conditions: (para 9-16-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES STAB MAN AC CIRCUIT BREAKER (CB7) STAY CLOSED?**

OPEN CB7 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-37. **DOES SHORT EXIST?**

REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB7-1 AND CB2-1
CB7-2 AND A76P1-37

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB7-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-37.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB7-2 AND A76P1-37.

GO TO PARA 9-16-1.

REPLACE CIRCUIT BREAKER CB7.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-16-1.

END OF TASK

9-16-23. ECS R NOSE GRBX HTR CIRCUIT BREAKER (CB211) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P2-q, -r, -s

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

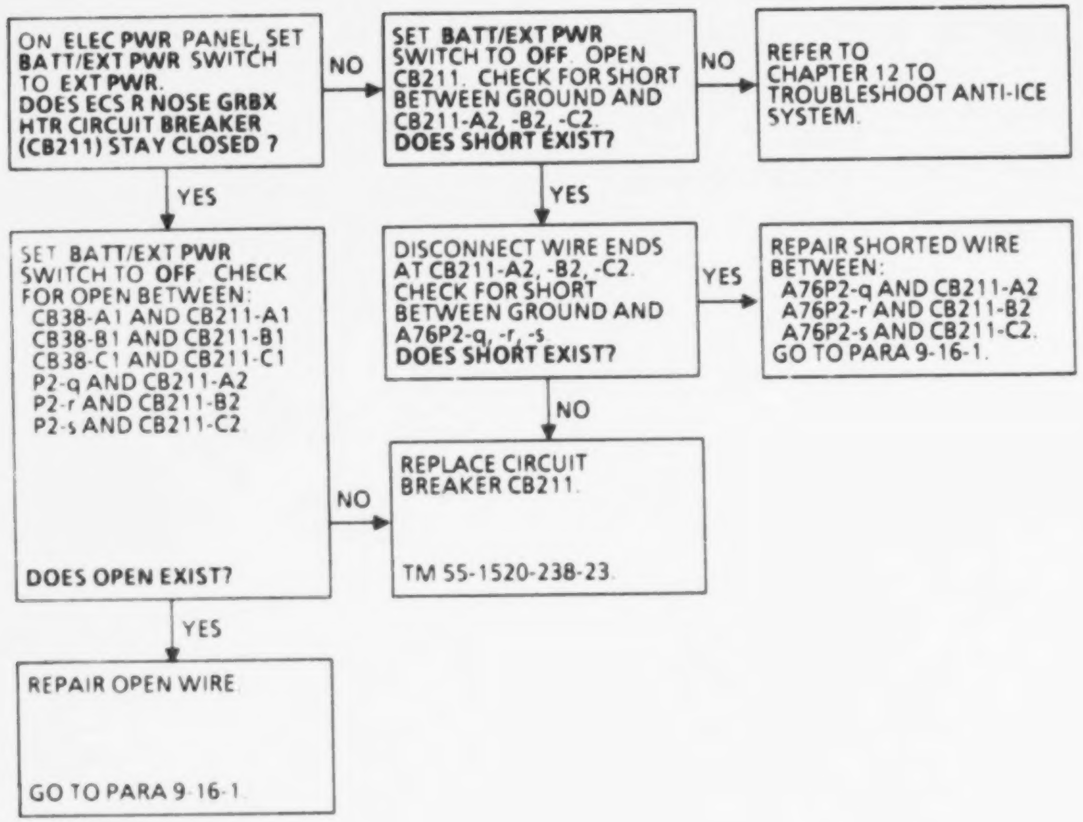
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES ECS R NOSE GRBX HTR CIRCUIT BREAKER (CB211) STAY CLOSED ?**

YES: SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB38-A1 AND CB211-A1
CB38-B1 AND CB211-B1
CB38-C1 AND CB211-C1
P2-q AND CB211-A2
P2-r AND CB211-B2
P2-s AND CB211-C2
DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-16-1.

NO: REPLACE CIRCUIT BREAKER CB211. TM 55-1520-238-23.

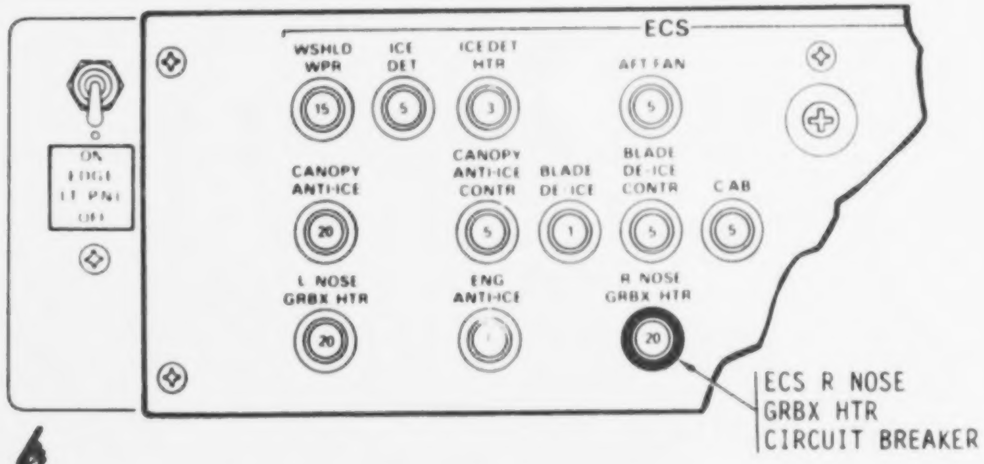
NO: SET **BATT/EXT PWR** SWITCH TO **OFF**. OPEN CB211. CHECK FOR SHORT BETWEEN GROUND AND CB211-A2, -B2, -C2. **DOES SHORT EXIST?**

NO: REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

YES: DISCONNECT WIRE ENDS AT CB211-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-q, -r, -s. **DOES SHORT EXIST?**

YES: REPAIR SHORTED WIRE BETWEEN:
A76P2-q AND CB211-A2
A76P2-r AND CB211-B2
A76P2-s AND CB211-C2.
GO TO PARA 9-16-1.

NO: REPLACE CIRCUIT BREAKER CB211. TM 55-1520-238-23.



PILOT AFT CIRCUIT BREAKER PANEL MM04/1-1565B

END OF TASK

9-17-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01- 39-2512

Personnel Required:

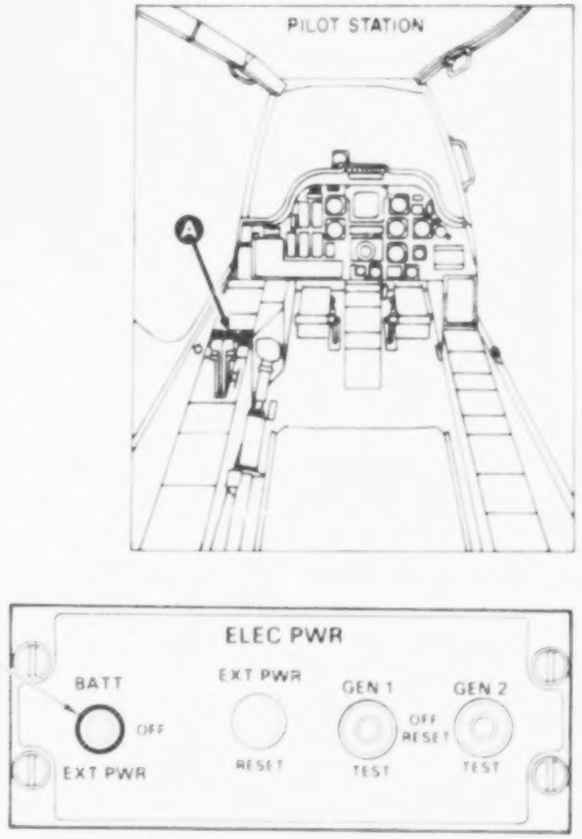
68F10 Aircraft Electrician

References:

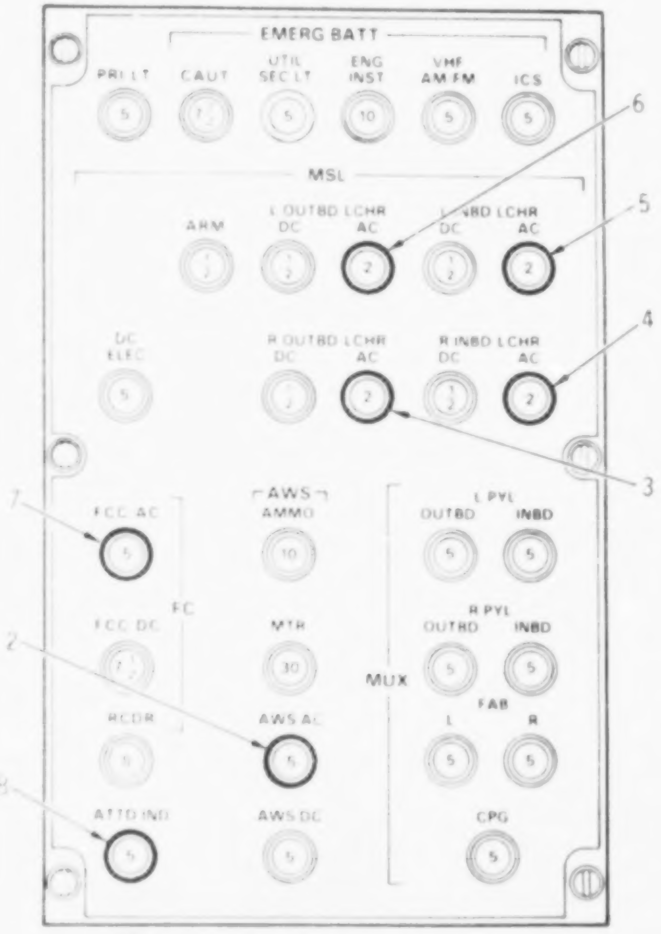
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical



A PILOT ELEC PWR PANEL



B CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1007-1B

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

A. On electrical power distribution box disconnect P461.

B. Complete operational check as follows:

	TASK	RESULT
1.	On CPG circuit breaker panel No. 1, open **AWS AWS AC**, **FC FCC AC**, and **ATTD IND**.	
1.1	Check for short between ground and P461-D, -E and -F.	If short exists go to para 9-17-4.
1.2	Check for short between ground and P461-L.	If short exists go to para 9-17-6.
1.3	On ELEC PWR panel, set **BATT/EXT PWR** switch to **EXT PWR**.	If 115 VAC is not present, go to para 9-2-2.
1.4	On electrical power distribution box, check for 115 VAC at A402J32 -D, -E, -F and -L.	
1.5	On ELEC PWR panel, set **BATT/EXT PWR** switch to **OFF**.	
1.6	Reconnect P461.	
1.7	On ELEC PWR panel, set **BATT/EXT PWR** switch to **EXT PWR**.	
1.8	On CPG circuit breaker panel No. 1, close **AWS AWS AC**, **FC FCC AC** and **ATTD IND**.	
2.	On CPG circuit breaker panel no. 1, check that **AWS AWS AC** (CB11) (2), **MSL R OUTBD LCHR AC** (CB18) (3), **MSL R INBD LCHR AC** (CB21) (4), **MSL L INBD LCHR AC** (CB24) (5), **MSL L OUTBD LCHR AC** (CB26) (6), **FC FCC AC** (CB16) (7), and **ATTD IND** (CB20) (8) circuit breakers are closed.	If CB11 (2) does not stay closed, go to para 9-17-7. If CB18 (3) does not stay closed, go to para 9-17-8. If CB21 (4) does not stay closed, go to para 9-17-9.

GO TO NEXT PAGE

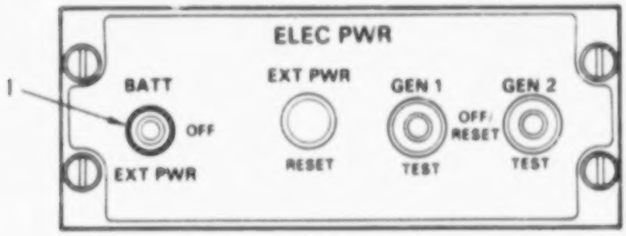
9-17-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) OPERATIONAL CHECK (cont)

TASK	RESULT
	If CB24 (5) does not stay closed, go to para 9-17-10. If CB26 (6) does not stay closed, go to para 9-17-11. If CB16 (7) does not stay closed, go to para 9-17-12. If CB20 (8) does not stay closed, go to para 9-17-13.
3. Deleted.	
4. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.	
5. On CPG circuit breaker panel No. 1, disconnect P766, P767, and P769.	
WARNING **Avoid touching circuit breaker panels to airframe, or crossing circuit breaker terminals with any tools. Failure to do so could result in death or serious injury.**	
6. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	
7. Check for 115 VAC at P769-L.	If 115 VAC is not present, go to para 9-17-6.
8. For helicopters serial numbers 82-23355 thru 85-25488, check for 115 VAC at P767-30 and -31. For helicopters serial numbers 86-8940 and subsequent, check for 115 VAC at P767-31.	If 115 VAC is not present, go to para 9-17-5.
9. Deleted.	
10. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.	
11. Check for continuity to gun and turret control boxes between A77J4-L and A77J2-12, -19.	If continuity does not exist, go to para 9-17-7.
12. Check for continuity to guided missile launcher 4 between A77J2-31 and A77J2-5.	If continuity does not exist, go to para 9-17-8.

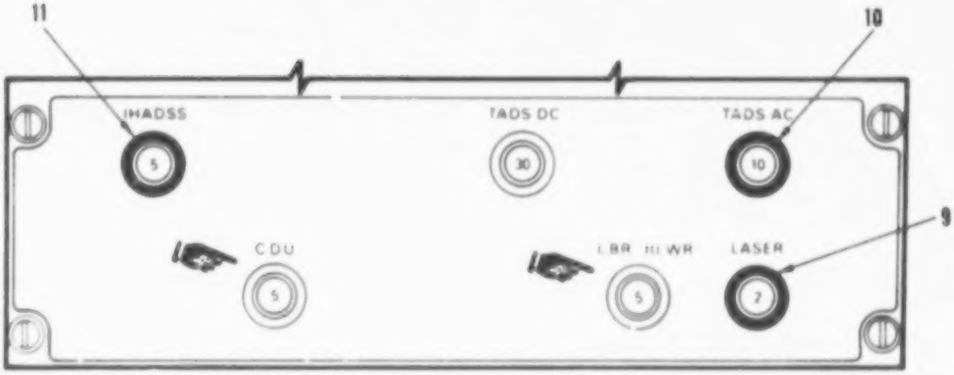
TASK	RESULT
13. Check for continuity to guided missile launcher 3 between A77J2-31 and A77J2-4.	If continuity does not exist, go to para 9-17-9.
14. Check for continuity to guided missile launcher 2 between A77J2-31 and A77J2-3.	If continuity does not exist, go to para 9-17-10.
15. Check for continuity to guided missile launcher 1 between A77J2-31 and A77J2-2.	If continuity does not exist, go to para 9-17-11.
16. For helicopters serial numbers 82-23355 thru 85-25488, check for continuity to fire control computer between A77J2-30 and A77J2-35.	If continuity does not exist, go to para 9-17-12.
16.1 For helicopters serial numbers 86-8940 and subsequent, check for continuity between A77J4-L and A77J2-35.	If continuity does not exist, go to para 9-17-17.
17. For helicopters serial numbers 82-23355 thru 85-25488, check for continuity to remote attitude indicator between A77J2-30 and A77J1-6.	If continuity does not exist, go to para 9-17-13.
17.1 For helicopters serial numbers 86-8940 and subsequent check for continuity between A77J4-L and A77J1-6.	If continuity does not exist, go to para 9-17-18.
18. On CPG circuit breaker panel No. 1, reconnect P766, P767, and P769.	
19. Check that **LASER** (CB4) (9), **TADS AC** (CB3) (10) and **IHADSS** (CB1) (11) circuit breakers on CPG circuit breaker panel No. 2 are closed.	
20. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	

GO TO NEXT PAGE

9-17-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) OPERATIONAL CHECK (cont)



PILOT ELEC PWR PANEL



CPG CIRCUIT BREAKER PANEL NO. 2

MM04/1-1007-3A

TASK	RESULT
21. Check that circuit breakers closed in step 19 remain closed.	If CB4 (9) does not stay closed, go to para 9-17-14. If CB3 (10) does not stay closed, go to para 9-17-15. If CB1 (11) does not stay closed, go to para 9-17-16.

WARNING

Avoid touching circuit breaker panels to airframe, or crossing circuit breaker terminals with any tools. Failure to do so could result in death or serious injury.

TASK	RESULT
22. On ELEC **PWR** panel, set **BATT/EXT PWR** switch to OFF.	
22.1 On CPG circuit breaker panel No. 2, disconnect P761 and A97P1.	
22.2 On ELEC **PWR** panel, set **BATT/EXT PWR** switch to EXT PWR.	
23. Check for 115 VAC to LASER electronic unit at A97J1-D, -B, -A.	If 115 VAC is not present, go to para 9-17-14.
24. Check for 115 VAC to TADS power supply and ORT at A97J1-H, -F, -E.	If 115 VAC is not present, go to para 9-17-15.
25. Check for 115 VAC at IHADSS SEU at A97P1-E, -D, -C.	If 115 VAC is not present, go to para 9-17-16.

C. On ELEC **PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.

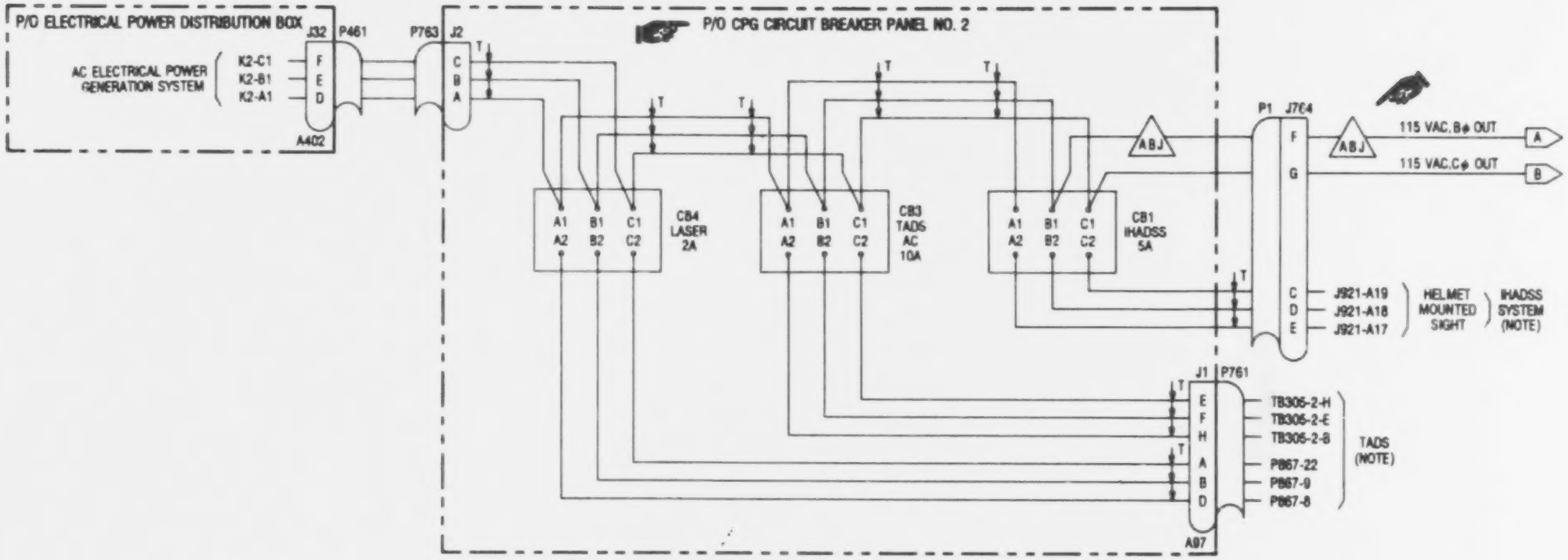
D. Reconnect P761 and A97P1.

E. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).

F. Remove external power - Electrical (TM 55-1520-238-23).

END OF TAS

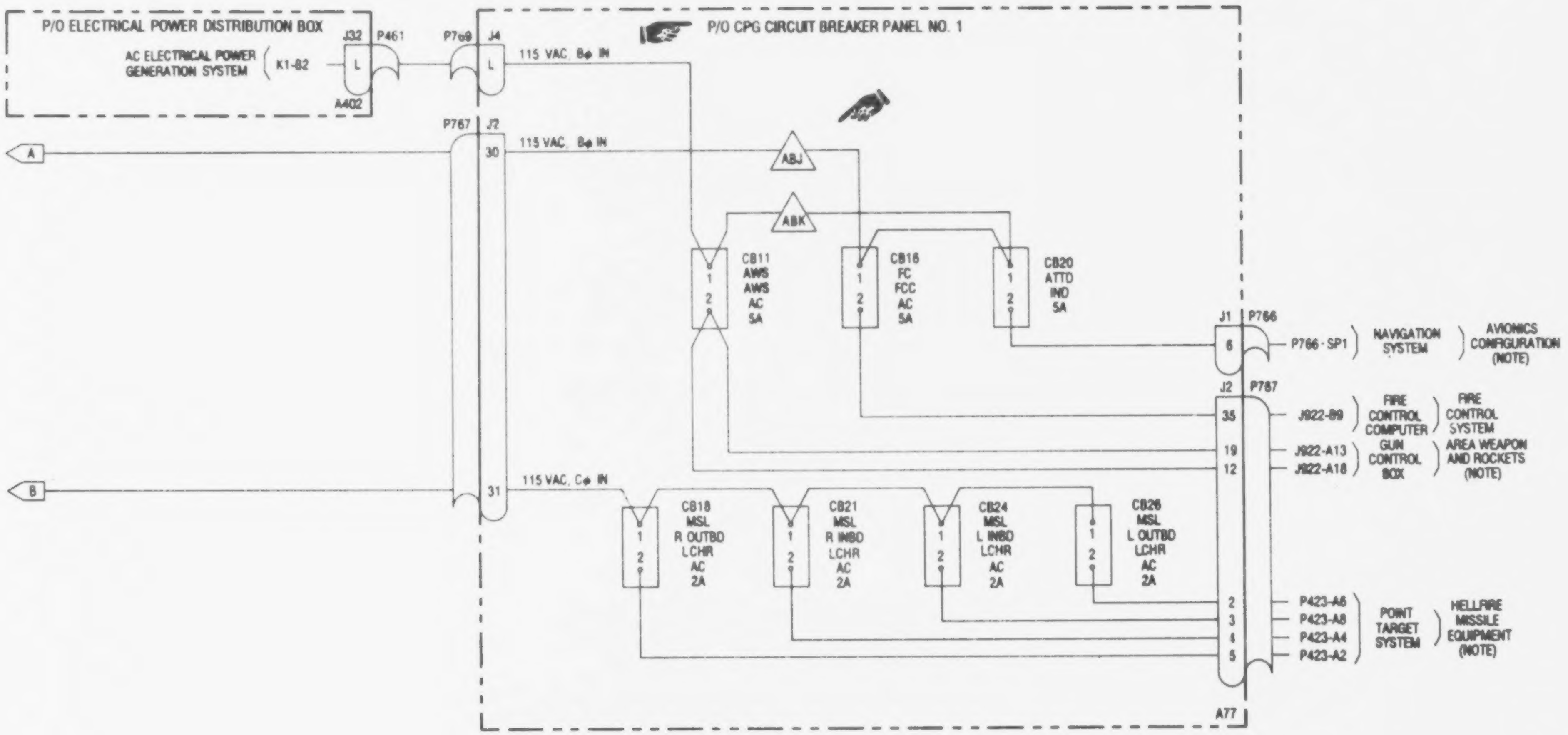
9-17-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) INTERCONNECTION DIAGRAM



NOTE:
REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

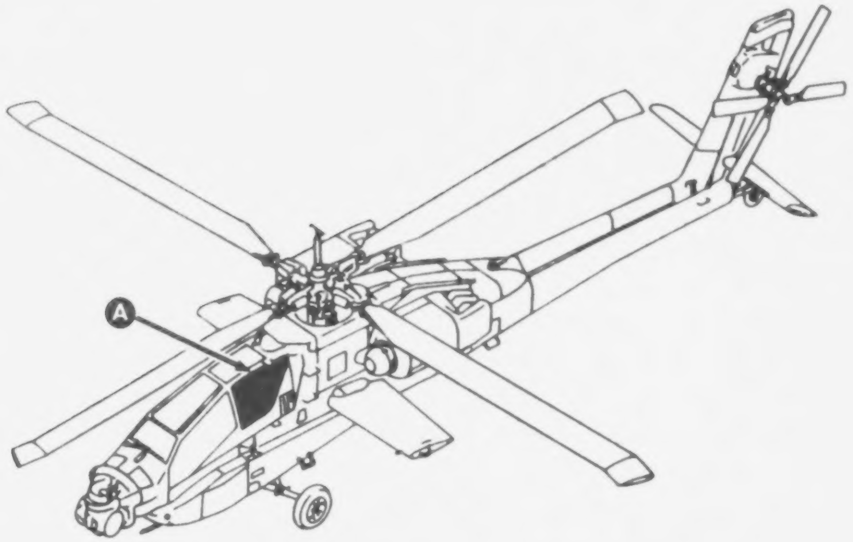
SHEET 1 OF 2 MM04/1-758-2D

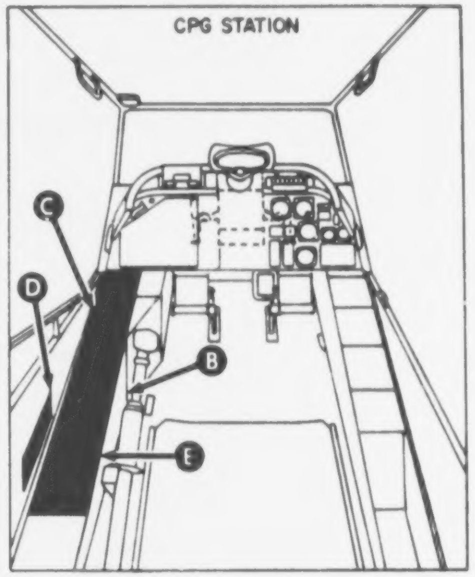
9-17-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) INTERCONNECTION DIAGRAM (cont)

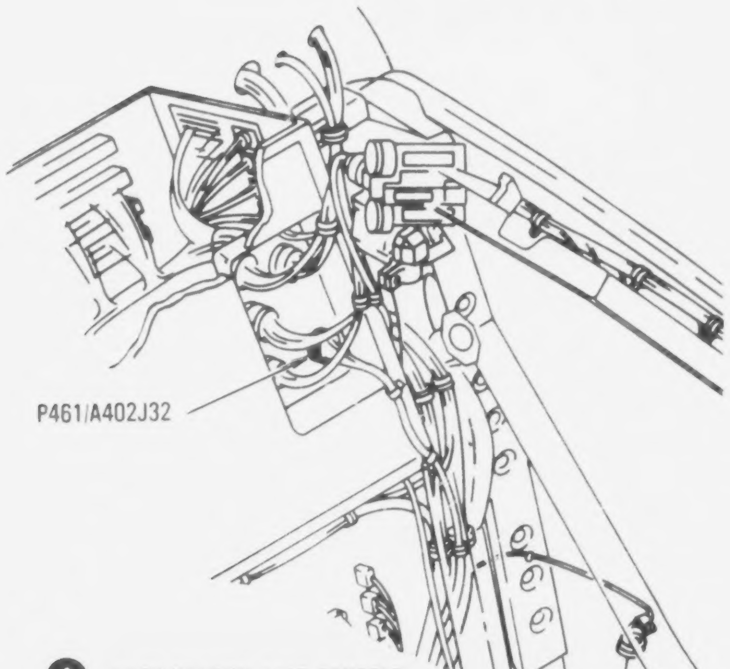


SHEET 2 OF 2 MM04/1-758-1D

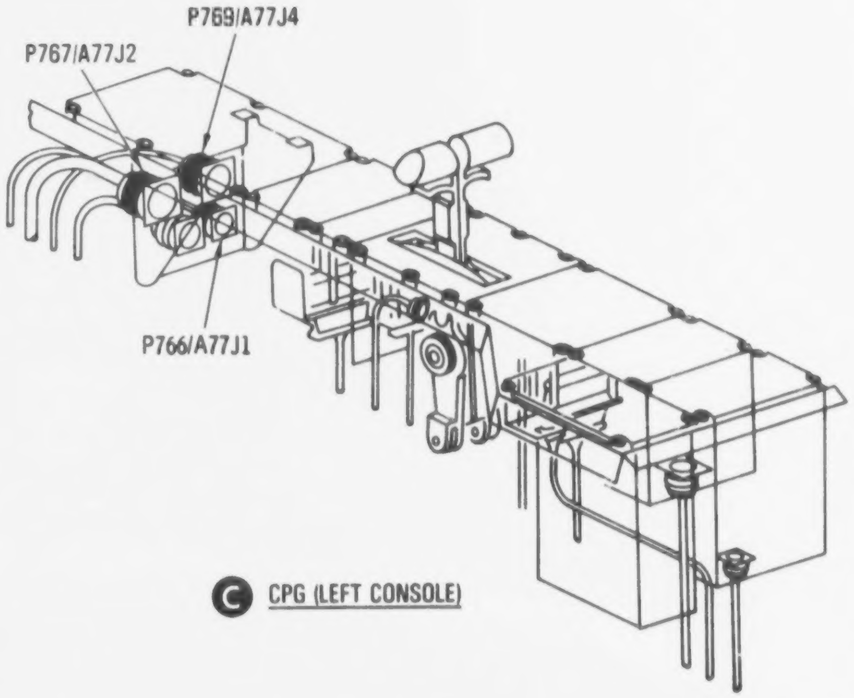
9-17-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



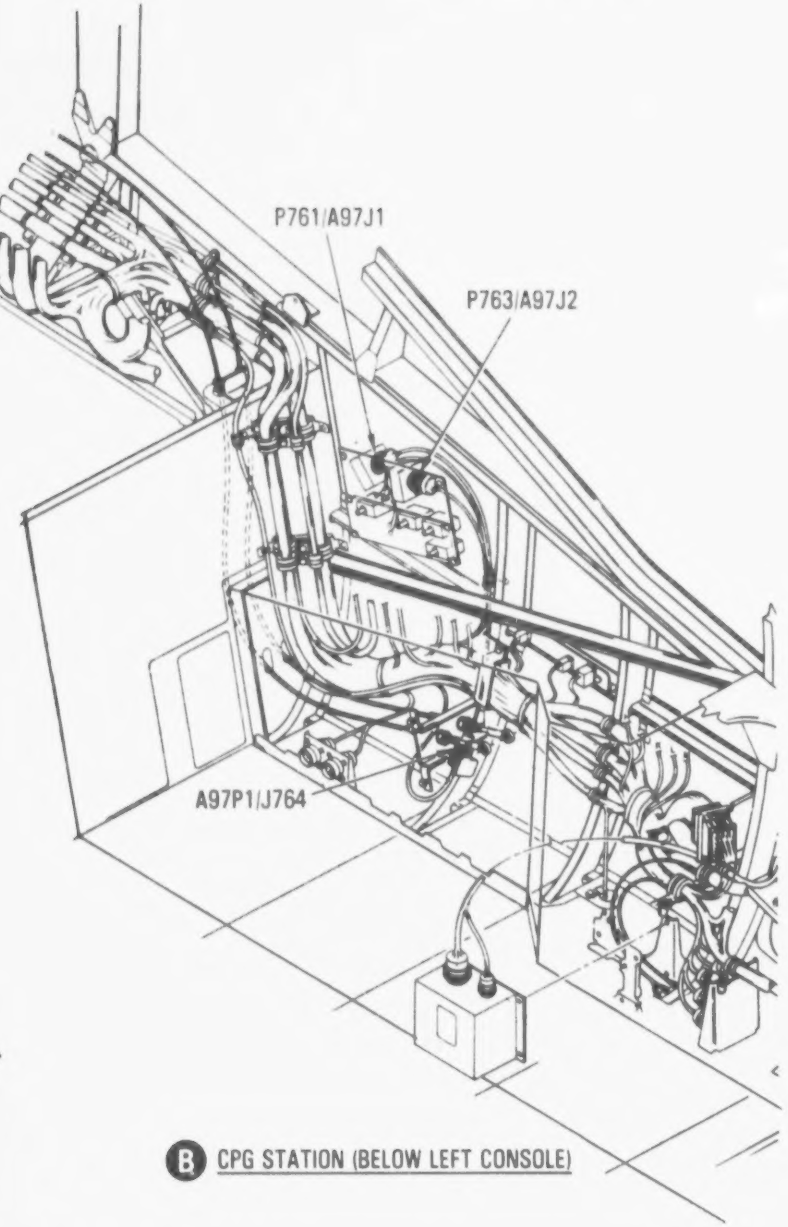




Ⓐ PILOT STATION (LEFT CONSOLE)



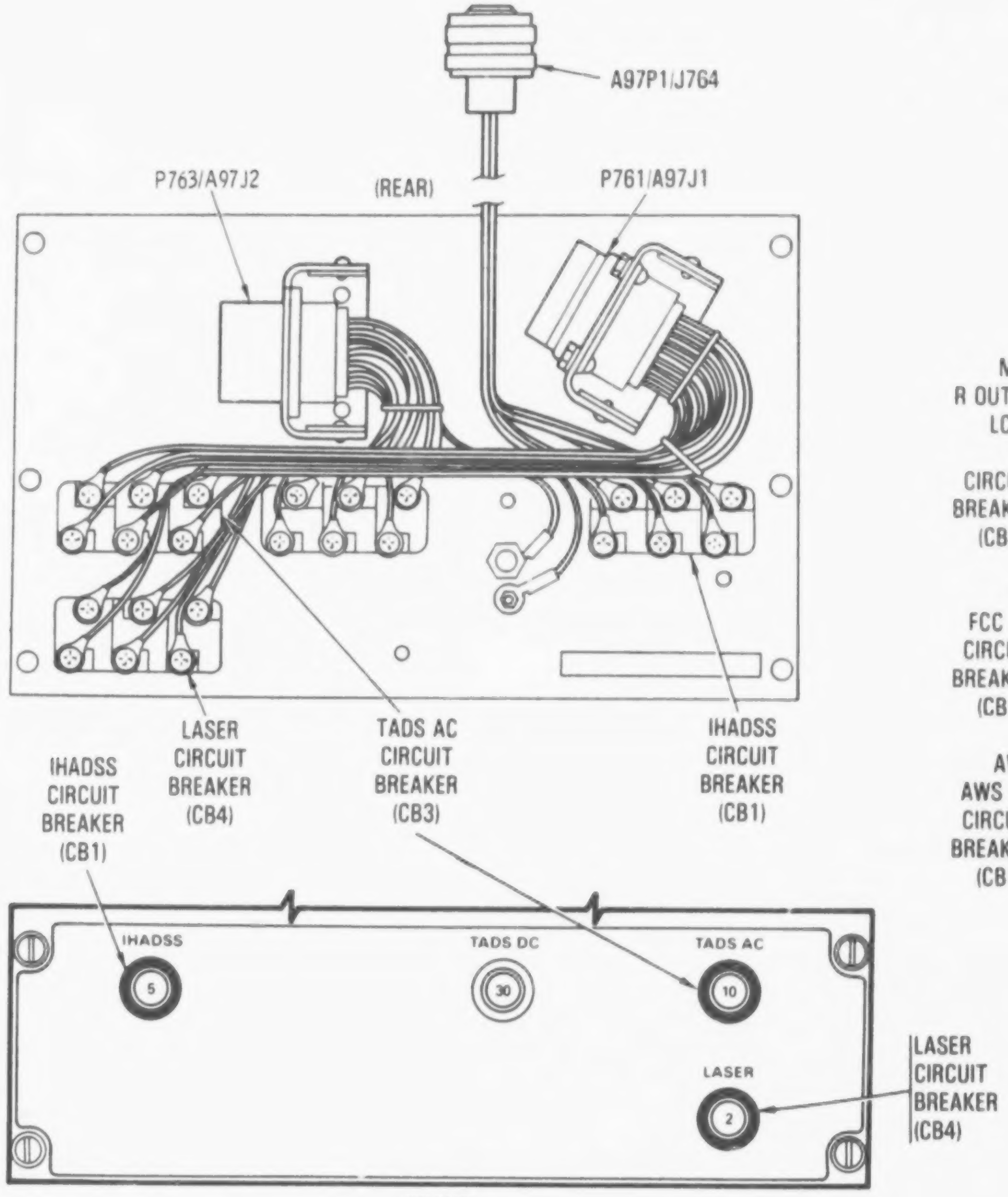
Ⓒ CPG (LEFT CONSOLE)



Ⓑ CPG STATION (BELOW LEFT CONSOLE)

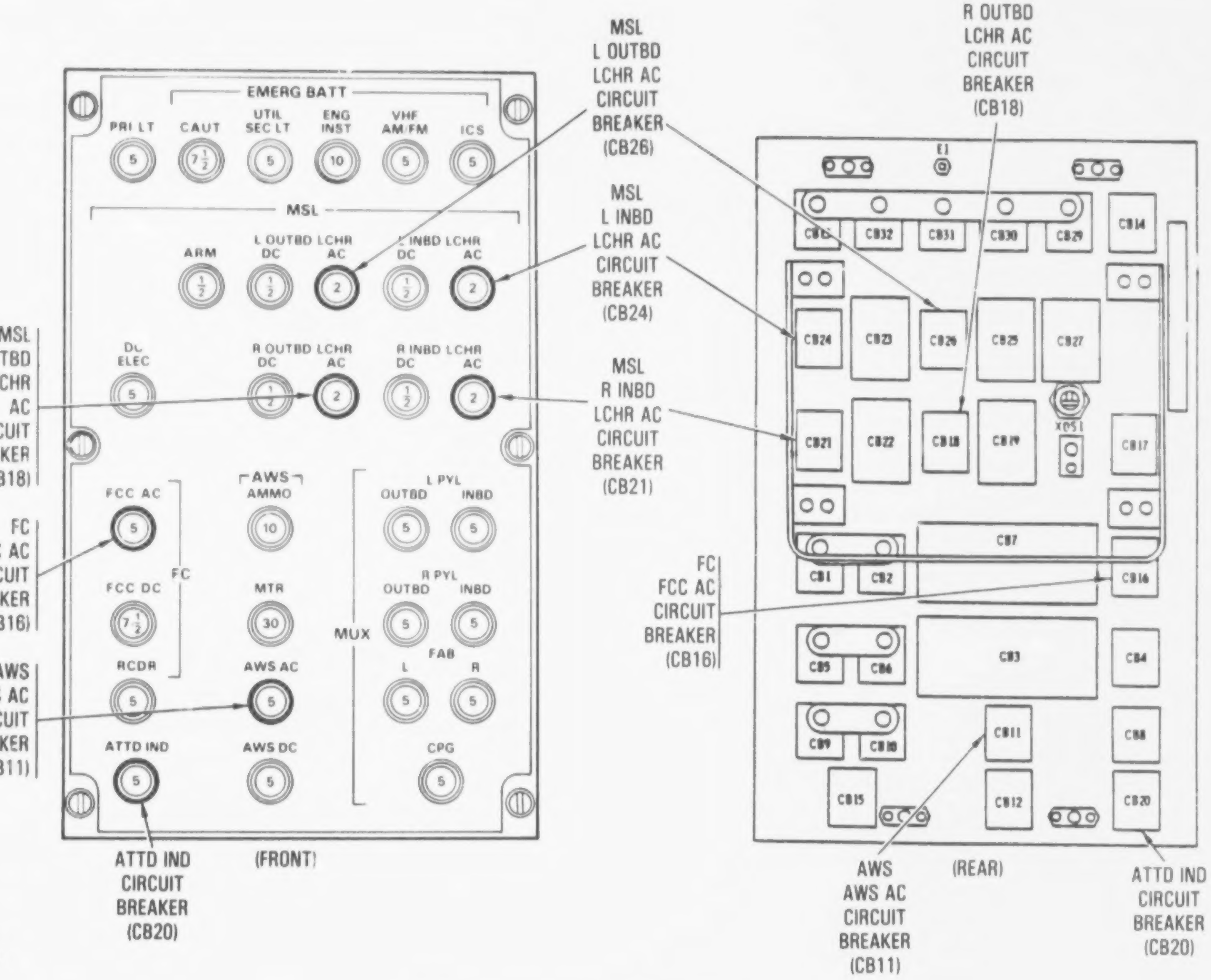
MM04/1-1058-1B

9-17-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 1 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)


A97P1/J764
P763/A97J2
(REAR)
P761/A97J1
LASER CIRCUIT BREAKER (CB4)
TADS AC CIRCUIT BREAKER (CB3)
IHADSS CIRCUIT BREAKER (CB1)
IHADSS CIRCUIT BREAKER (CB1)
IHADSS
5
TADS DC
30
TADS AC
10
LASER
2
LASER CIRCUIT BREAKER (CB4)

(FRONT)

D CPG CIRCUIT BREAKER PANEL NO. 2


EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
MSL
ARM
L OUTBD LCHR DC
AC
L INBD LCHR DC
AC
DC ELEC
R OUTBD LCHR DC
AC
R INBD LCHR DC
AC
FCC AC
AWS
AMMO
L PYL OUTBD
INBD
FC
FCC DC
MTR
R PYL OUTBD
INBD
MUX
RCDR
AWS AC
FAB L
R
ATTD IND
AWS DC
CPG
MSL R OUTBD LCHR AC CIRCUIT BREAKER (CB18)
FC FCC AC CIRCUIT BREAKER (CB16)
AWS AWS AC CIRCUIT BREAKER (CB11)
MSL L OUTBD LCHR AC CIRCUIT BREAKER (CB26)
MSL L INBD LCHR AC CIRCUIT BREAKER (CB24)
MSL R INBD LCHR AC CIRCUIT BREAKER (CB21)
ATTD IND CIRCUIT BREAKER (CB20)
(FRONT)
MSL R OUTBD LCHR AC CIRCUIT BREAKER (CB18)
E1
CB33
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
CB21
CB22
CB18
CB19
XDS1
CB17
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
CB9
CB10
CB11
CB8
CB15
CB12
CB20
FC FCC AC CIRCUIT BREAKER (CB16)
AWS AWS AC CIRCUIT BREAKER (CB11)
(REAR)
ATTD IND CIRCUIT BREAKER (CB20)

E CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1058-2A

9-17-4. SHORT EXISTS BETWEEN GROUND AND P461-D, -E OR -F

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

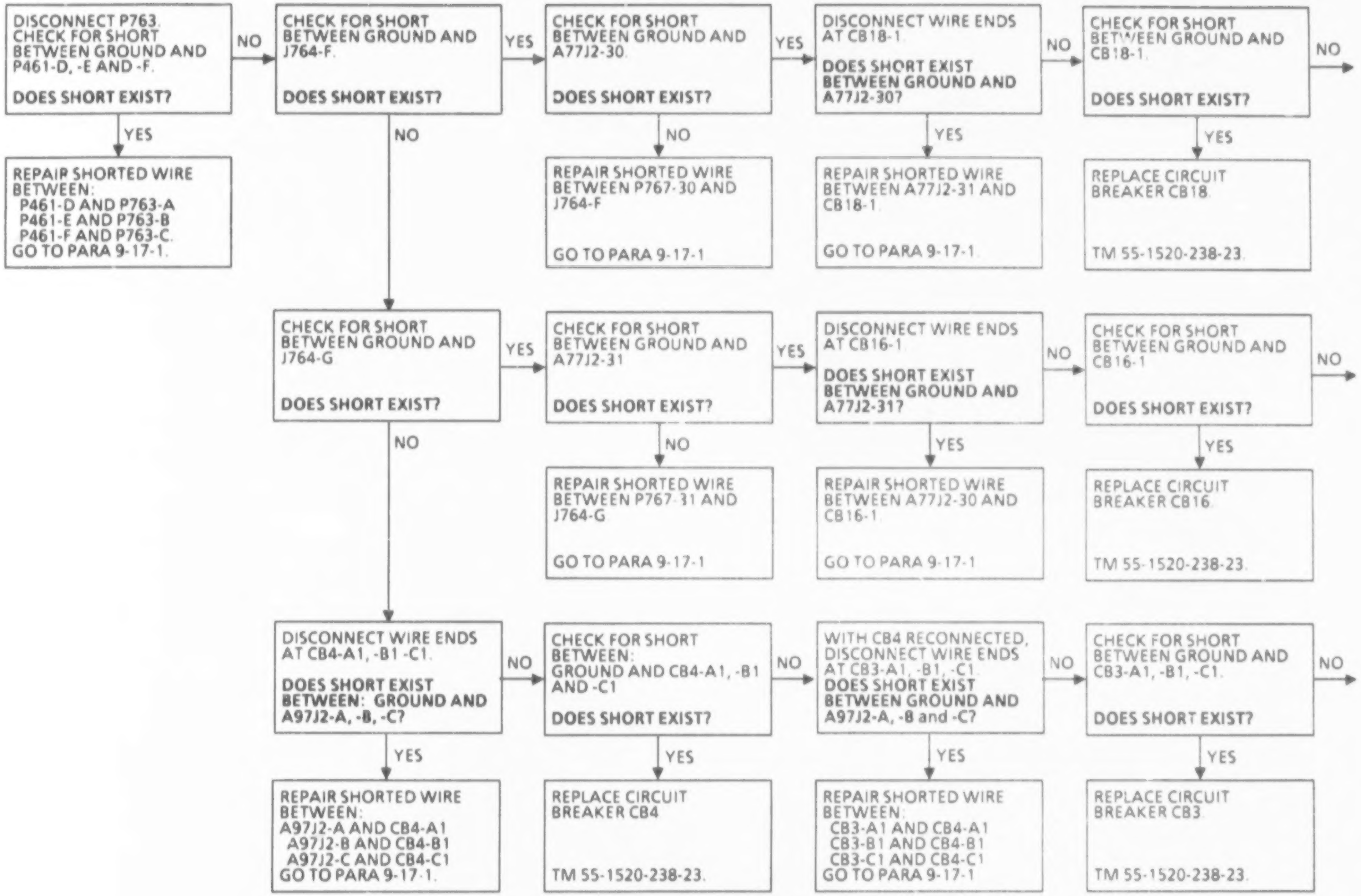
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

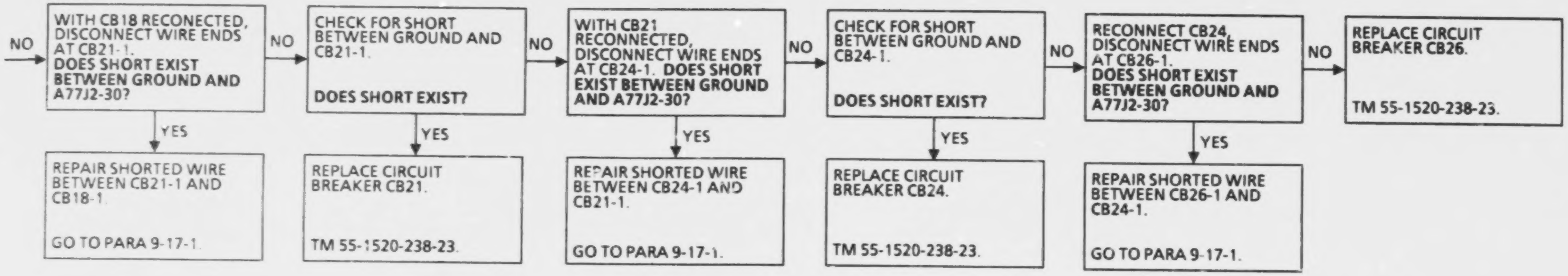
Equipment Conditions:

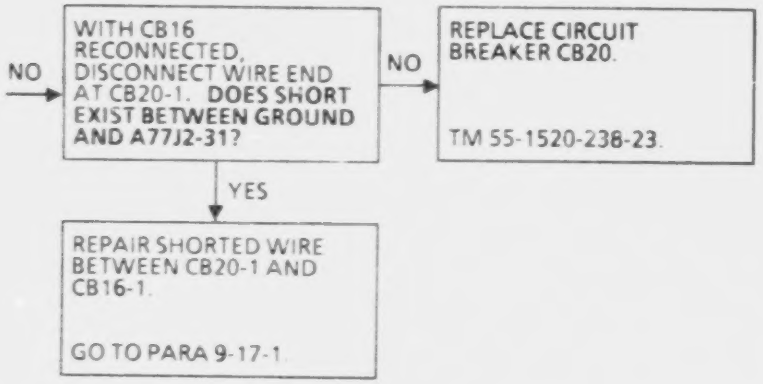
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-1	All CPG AC essential bus 1 circuit breakers open

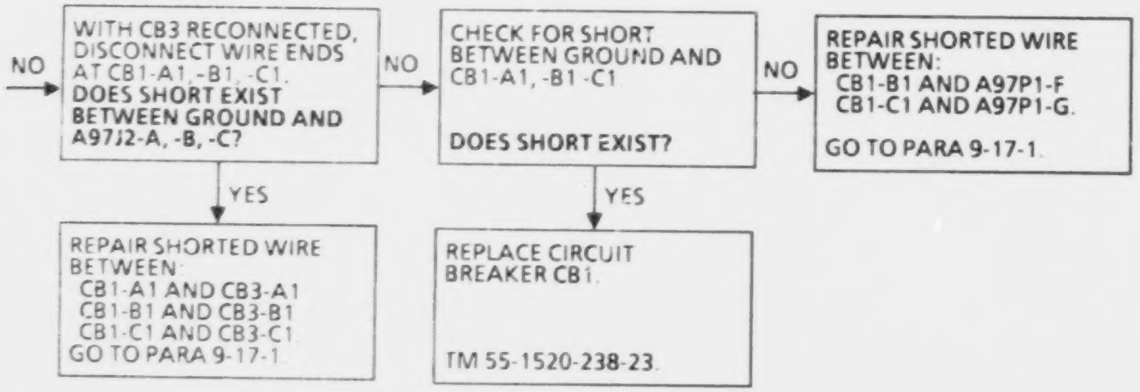

DISCONNECT P763. CHECK FOR SHORT BETWEEN GROUND AND P461-D, -E AND -F.
DOES SHORT EXIST?
NO
YES
REPAIR SHORTED WIRE BETWEEN:
P461-D AND P763-A
P461-E AND P763-B
P461-F AND P763-C.
GO TO PARA 9-17-1.
CHECK FOR SHORT BETWEEN GROUND AND J764-F.
DOES SHORT EXIST?
YES
NO
CHECK FOR SHORT BETWEEN GROUND AND A77J2-30.
DOES SHORT EXIST?
YES
NO
REPAIR SHORTED WIRE BETWEEN P767-30 AND J764-F
GO TO PARA 9-17-1
DISCONNECT WIRE ENDS AT CB18-1.
DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
NO
YES
REPAIR SHORTED WIRE BETWEEN A77J2-31 AND CB18-1.
GO TO PARA 9-17-1.
CHECK FOR SHORT BETWEEN GROUND AND CB18-1.
DOES SHORT EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB18.
TM 55-1520-238-23.
CHECK FOR SHORT BETWEEN GROUND AND J764-G
DOES SHORT EXIST?
YES
NO
CHECK FOR SHORT BETWEEN GROUND AND A77J2-31
DOES SHORT EXIST?
YES
NO
REPAIR SHORTED WIRE BETWEEN P767-31 AND J764-G
GO TO PARA 9-17-1
DISCONNECT WIRE ENDS AT CB16-1
DOES SHORT EXIST BETWEEN GROUND AND A77J2-31?
NO
YES
REPAIR SHORTED WIRE BETWEEN A77J2-30 AND CB16-1.
GO TO PARA 9-17-1
CHECK FOR SHORT BETWEEN GROUND AND CB16-1
DOES SHORT EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB16.
TM 55-1520-238-23.
DISCONNECT WIRE ENDS AT CB4-A1, -B1 -C1.
DOES SHORT EXIST BETWEEN: GROUND AND A97J2-A, -B, -C?
NO
YES
REPAIR SHORTED WIRE BETWEEN:
A97J2-A AND CB4-A1
A97J2-B AND CB4-B1
A97J2-C AND CB4-C1
GO TO PARA 9-17-1.
CHECK FOR SHORT BETWEEN: GROUND AND CB4-A1, -B1 AND -C1
DOES SHORT EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB4
TM 55-1520-238-23.
WITH CB4 RECONNECTED, DISCONNECT WIRE ENDS AT CB3-A1, -B1, -C1.
DOES SHORT EXIST BETWEEN GROUND AND A97J2-A, -B and -C?
NO
YES
REPAIR SHORTED WIRE BETWEEN:
CB3-A1 AND CB4-A1
CB3-B1 AND CB4-B1
CB3-C1 AND CB4-C1
GO TO PARA 9-17-1
CHECK FOR SHORT BETWEEN GROUND AND CB3-A1, -B1, -C1.
DOES SHORT EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB3.
TM 55-1520-238-23.

GO TO NEXT PAGE

9-17-4. SHORT EXISTS BETWEEN GROUND AND P461-D, -E OR -F (cont)


NO
WITH CB18 RECONNECTED, DISCONNECT WIRE ENDS AT CB21-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
YES
REPAIR SHORTED WIRE BETWEEN CB21-1 AND CB18-1. GO TO PARA 9-17-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB21-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB21. TM 55-1520-238-23.
NO
WITH CB21 RECONNECTED, DISCONNECT WIRE ENDS AT CB24-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
YES
REPAIR SHORTED WIRE BETWEEN CB24-1 AND CB21-1. GO TO PARA 9-17-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB24-1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
NO
RECONNECT CB24, DISCONNECT WIRE ENDS AT CB26-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-30?
YES
REPAIR SHORTED WIRE BETWEEN CB26-1 AND CB24-1. GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.


NO
WITH CB16 RECONNECTED, DISCONNECT WIRE END AT CB20-1. DOES SHORT EXIST BETWEEN GROUND AND A77J2-31?
YES
REPAIR SHORTED WIRE BETWEEN CB20-1 AND CB16-1. GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB20. TM 55-1520-238-23.


NO
WITH CB3 RECONNECTED, DISCONNECT WIRE ENDS AT CB1-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A97J2-A, -B, -C?
YES
REPAIR SHORTED WIRE BETWEEN: CB1-A1 AND CB3-A1 CB1-B1 AND CB3-B1 CB1-C1 AND CB3-C1 GO TO PARA 9-17-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB1-A1, -B1 -C1. DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB1. TM 55-1520-238-23.
NO
REPAIR SHORTED WIRE BETWEEN: CB1-B1 AND A97P1-F CB1-C1 AND A97P1-G. GO TO PARA 9-17-1.

END OF TASK

best copy available
Reproduced from poor document.

9-17-5. 115 VAC-IS NOT PRESENT AT P767-30, -31 OR 115 VAC-IS NOT PRESENT AT P767-31

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

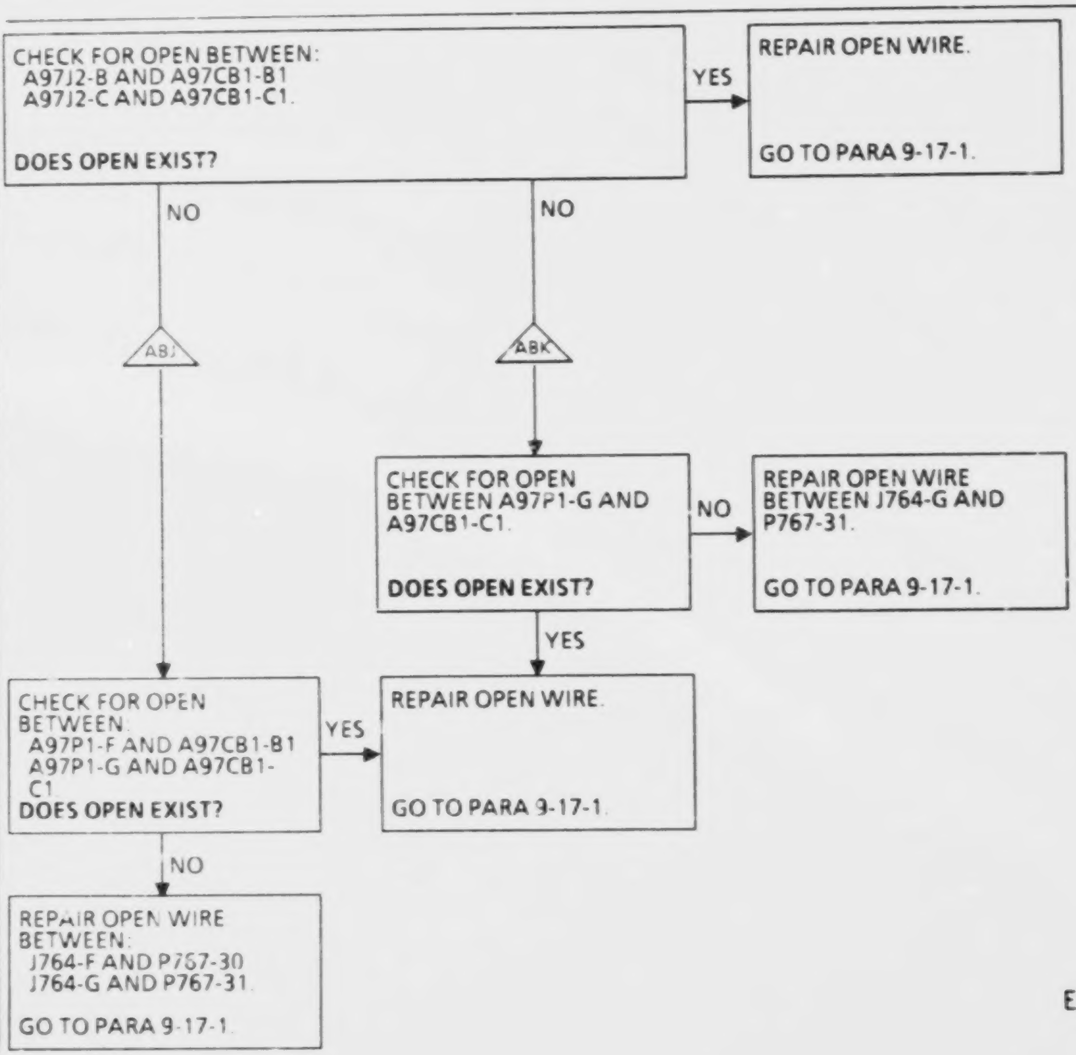
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-1	All CPG AC essential bus 1 circuit breakers open



END OF TASK

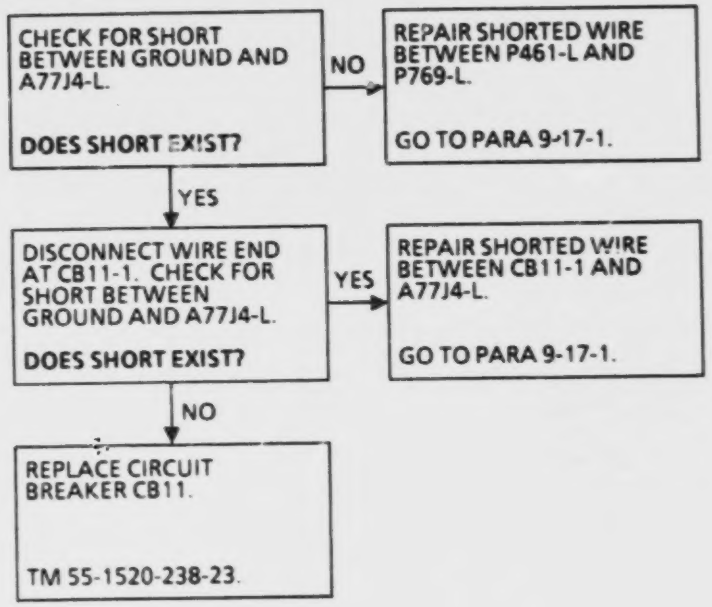
9-17-6. SHORT EXISTS BETWEEN GROUND AND P461-L

Tools: (para 9-17-5)

Personnel Required: (para 9-17-5)

References: (para 9-17-5)

Equipment Conditions: (para 9-17-5)


CHECK FOR SHORT BETWEEN GROUND AND A77J4-L.
DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN P461-L AND P769-L.
GO TO PARA 9-17-1.
YES
DISCONNECT WIRE END AT CB11-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-L.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB11-1 AND A77J4-L.
GO TO PARA 9-17-1.
NO
REPLACE CIRCUIT BREAKER CB11.
TM 55-1520-238-23.

END OF TASK

9-17-7. AWS AWS AC CIRCUIT BREAKER (CB11) - DOES NOT STAY CLOSED OR CONTINUITY TO GUN AND TURRET CONTROL BOXES DOES NOT EXIST BETWEEN A77J4-L AND A77J2-12, -19

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

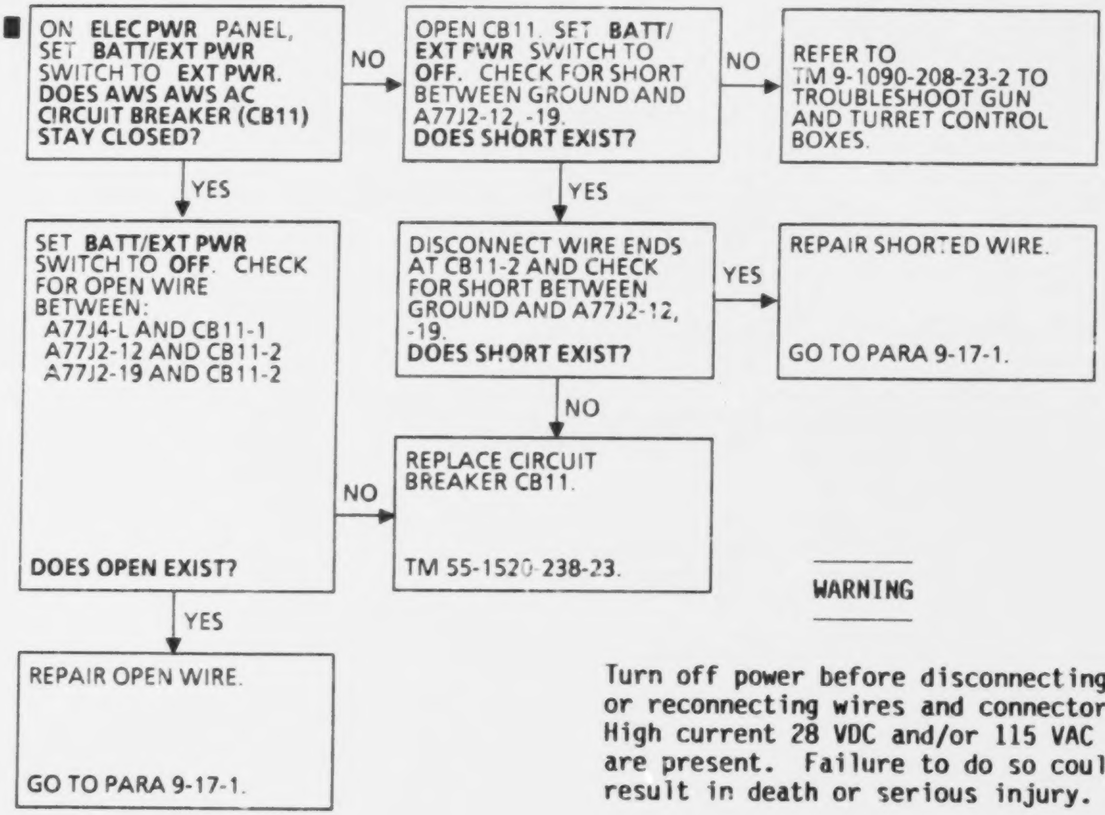
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES AWS AWS AC CIRCUIT BREAKER (CB11) STAY CLOSED?**

OPEN CB11. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A77J2-12, -19. **DOES SHORT EXIST?**

REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT GUN AND TURRET CONTROL BOXES.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN WIRE BETWEEN:
A77J4-L AND CB11-1
A77J2-12 AND CB11-2
A77J2-19 AND CB11-2
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB11-2 AND CHECK FOR SHORT BETWEEN GROUND AND A77J2-12, -19. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.
GO TO PARA 9-17-1.

REPLACE CIRCUIT BREAKER CB11.
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-17-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-17-8. MSL R OUTBD LCHR AC CIRCUIT BREAKER (CB18) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 4 DOES NOT EXIST BETWEEN A77J2-5 AND -31

Tools: (para 9-17-7)

Personnel Required: (para 9-17-7)

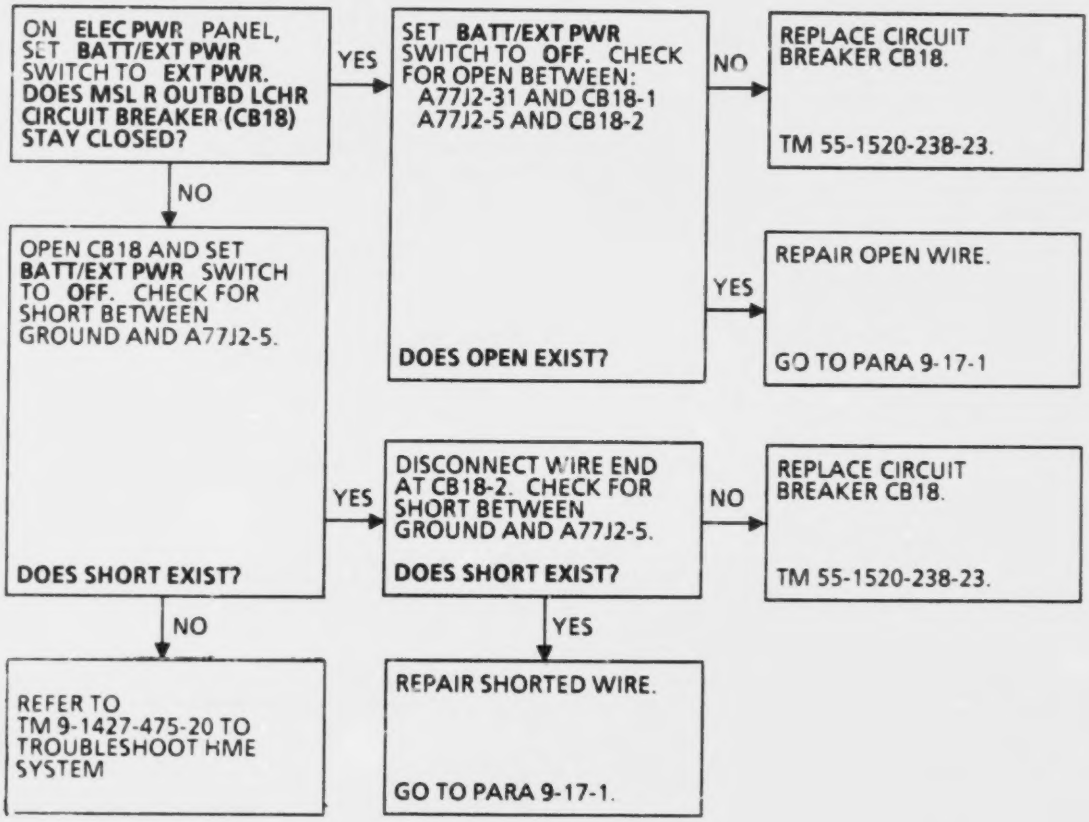
References:

TM 55-1520-238-23
TM 9-1427-475-20

Equipment Conditions: (para 9-17-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL R OUTBD LCHR CIRCUIT BREAKER (CB18) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: A77J2-31 AND CB18-1 A77J2-5 AND CB18-2
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
NO
OPEN CB18 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-5.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB18-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-5.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB18. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM

END OF TASK

9-17-9. MSL R INBD LCHR AC CIRCUIT BREAKER (CB21) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 3 DOES NOT EXIST BETWEEN A77J2-31 AND -4

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

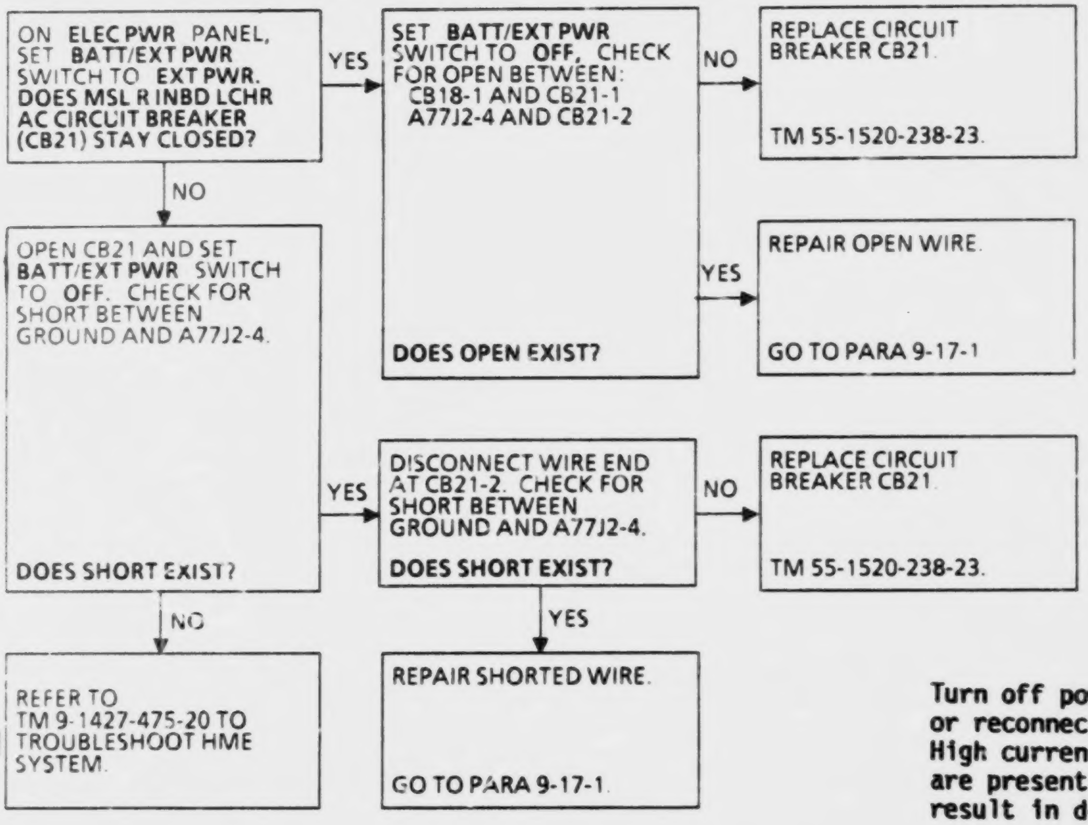
References:

TM 55-1520-238-23
TM 9-1427-475-20

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL R INBD LCHR AC CIRCUIT BREAKER (CB21) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB18-1 AND CB21-1 A77J2-4 AND CB21-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB21. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
NO
OPEN CB21 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-4. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB21-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-4. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB21. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-17-10. MSL L INBD LCHR AC CIRCUIT BREAKER (CB24) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 2 DOES NOT EXIST BETWEEN A77J2-31 AND -3

Tools: (para 9-17-9)

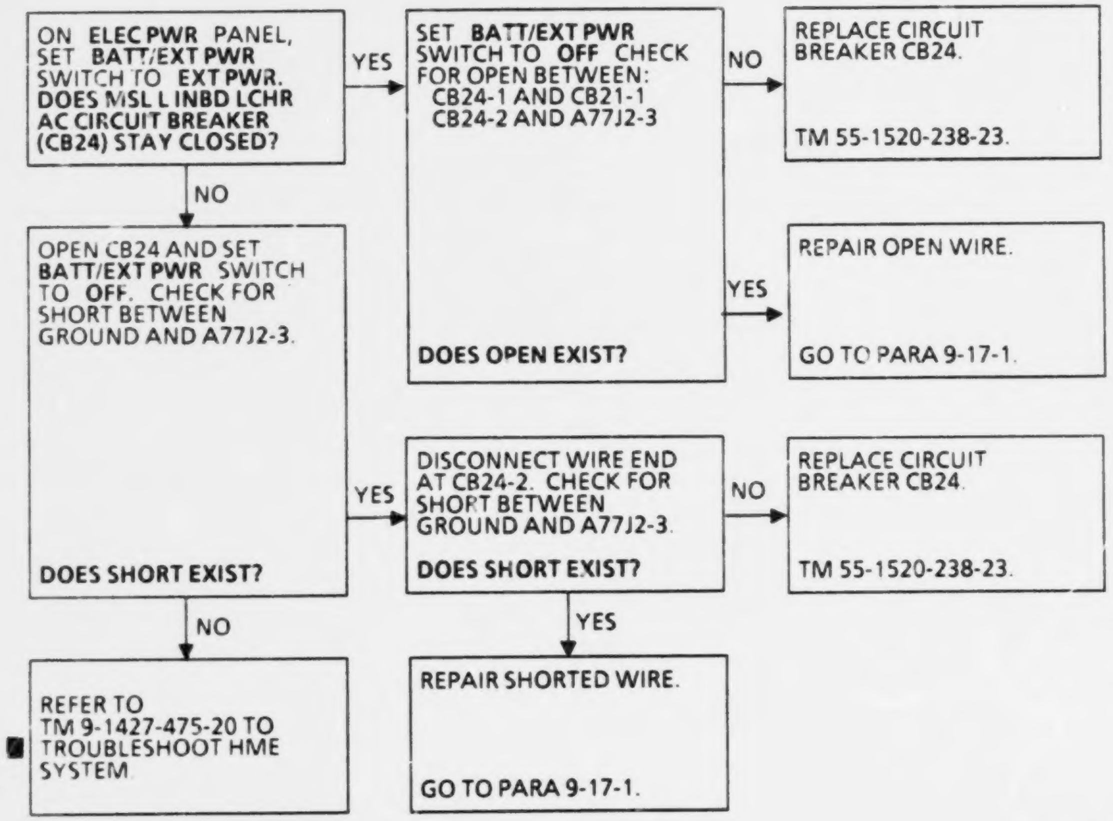
Personnel Required: (para 9-17-9)

References: (para 9-17-9)

Equipment Conditions: (para 9-17-9)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL L INBD LCHR AC CIRCUIT BREAKER (CB24) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF CHECK FOR OPEN BETWEEN: CB24-1 AND CB21-1 CB24-2 AND A77J2-3 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.
NO
OPEN CB24 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-3. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB24-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-3. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB24. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM.

END OF TASK

9-17-11. MSL L OUTBD LCHR AC CIRCUIT BREAKER (CB26) - DOES NOT STAY CLOSED OR CONTINUITY TO MISSILE LAUNCHER 1 DOES NOT EXIST BETWEEN A77J2-31 AND -2

Tools: (para 9-17-9)

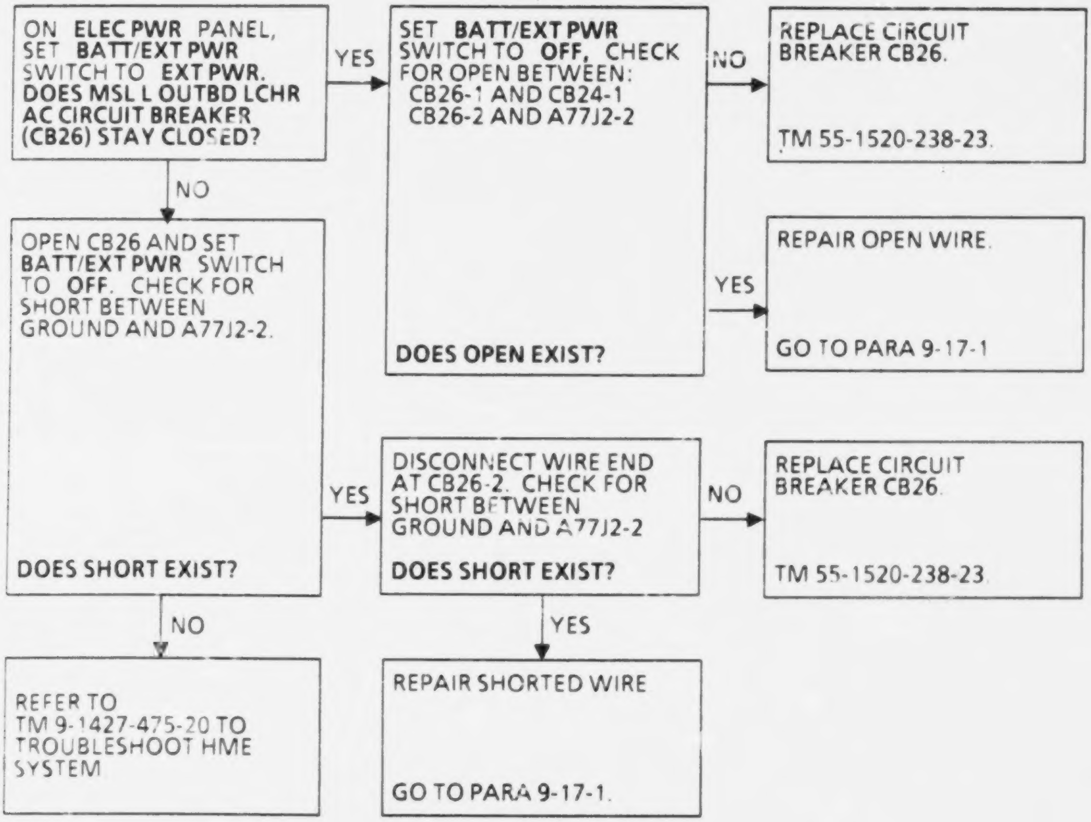
Personnel Required: (para 9-17-9)

References: (para 9-17-9)

Equipment Conditions: (para 9-17-9)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL L OUTBD LCHR AC CIRCUIT BREAKER (CB26) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB26-1 AND CB24-1 CB26-2 AND A77J2-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
NO
OPEN CB26 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-2. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB26-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-2 DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB26. TM 55-1520-238-23.
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT HME SYSTEM
YES
REPAIR SHORTED WIRE GO TO PARA 9-17-1.

END OF TASK

9-17-12. FC FCC AC CIRCUIT BREAKER (CB16) - DOES NOT STAY CLOSED OR CONTINUITY TO FIRE CONTROL PANEL DOES NOT EXIST BETWEEN A77J2-30 AND -35

Tools: (para 9-17-9)

Personnel Required: (para 9-17-9)

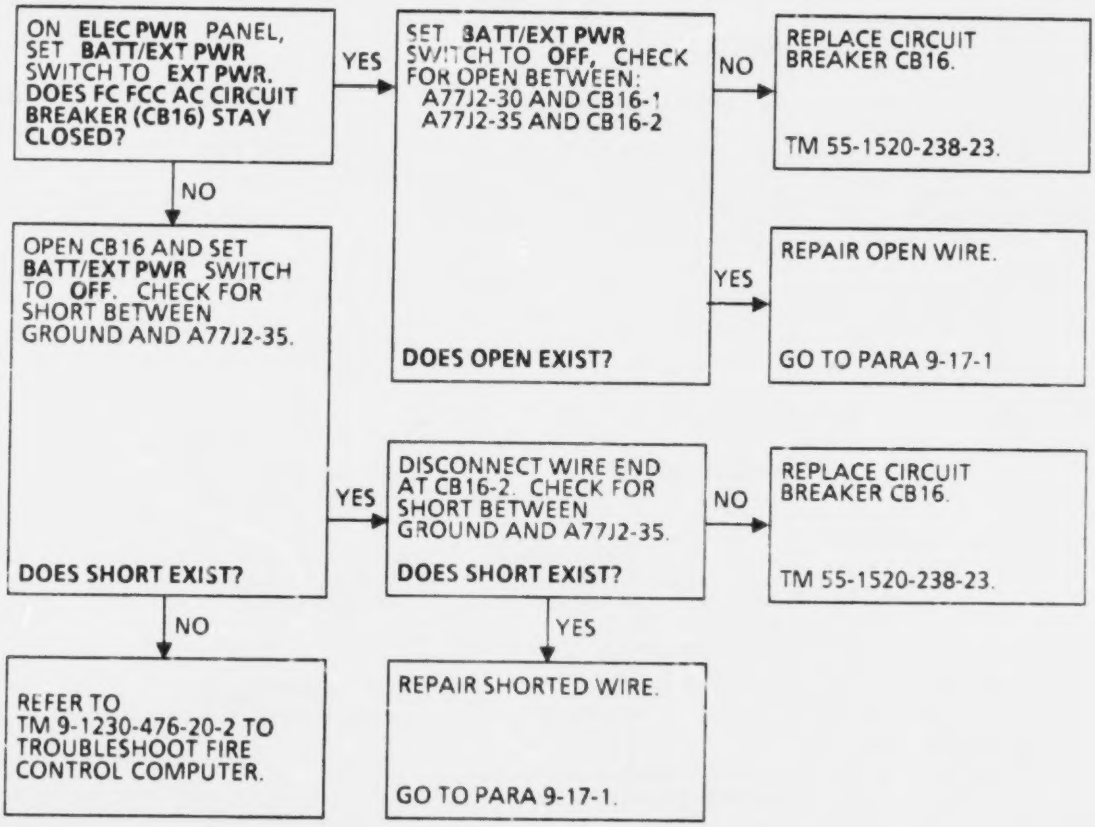
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-17-9)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FC FCC AC CIRCUIT BREAKER (CB16) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: A77J2-30 AND CB16-1 A77J2-35 AND CB16-2
NO
REPLACE CIRCUIT BREAKER CB16. TM 55-1520-238-23.
NO
OPEN CB16 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-35.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1
DOES OPEN EXIST?
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB16-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-35. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB16. TM 55-1520-238-23.
NO
YES
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL COMPUTER.
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.

END OF TASK

9-17-13. ATTD IND CIRCUIT BREAKER (CB20) - DOES NOT STAY CLOSED OR CONTINUITY TO REMOTE ATITUDE INDICATOR DOES NOT EXIST BETWEEN A77J2 -30 AND A77J1-6

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

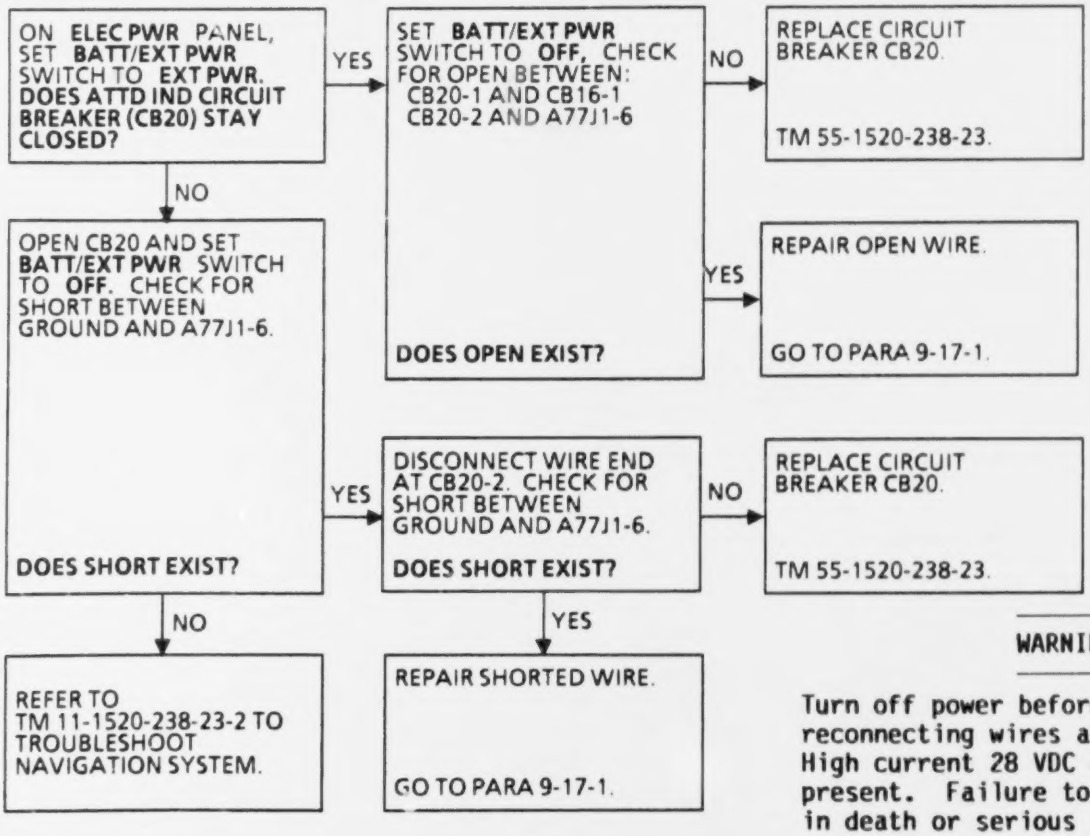
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** **DOES ATTD IND CIRCUIT BREAKER (CB20) STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB20-1 AND CB16-1
CB20-2 AND A77J1-6
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB20. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-17-1.

OPEN CB20 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A77J1-6. **DOES SHORT EXIST?**

DISCONNECT WIRE END AT CB20-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-6. **DOES SHORT EXIST?**

REPLACE CIRCUIT BREAKER CB20. TM 55-1520-238-23.

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT NAVIGATION SYSTEM.

REPAIR SHORTED WIRE. GO TO PARA 9-17-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-17-14. LASER CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED OR 115 VAC TO LASER ELECTRONIC UNIT IS NOT PRESENT AT A97J1-A, -B, -D

Tools: (para 9-17-13)

Personnel Required: (para 9-17-13)

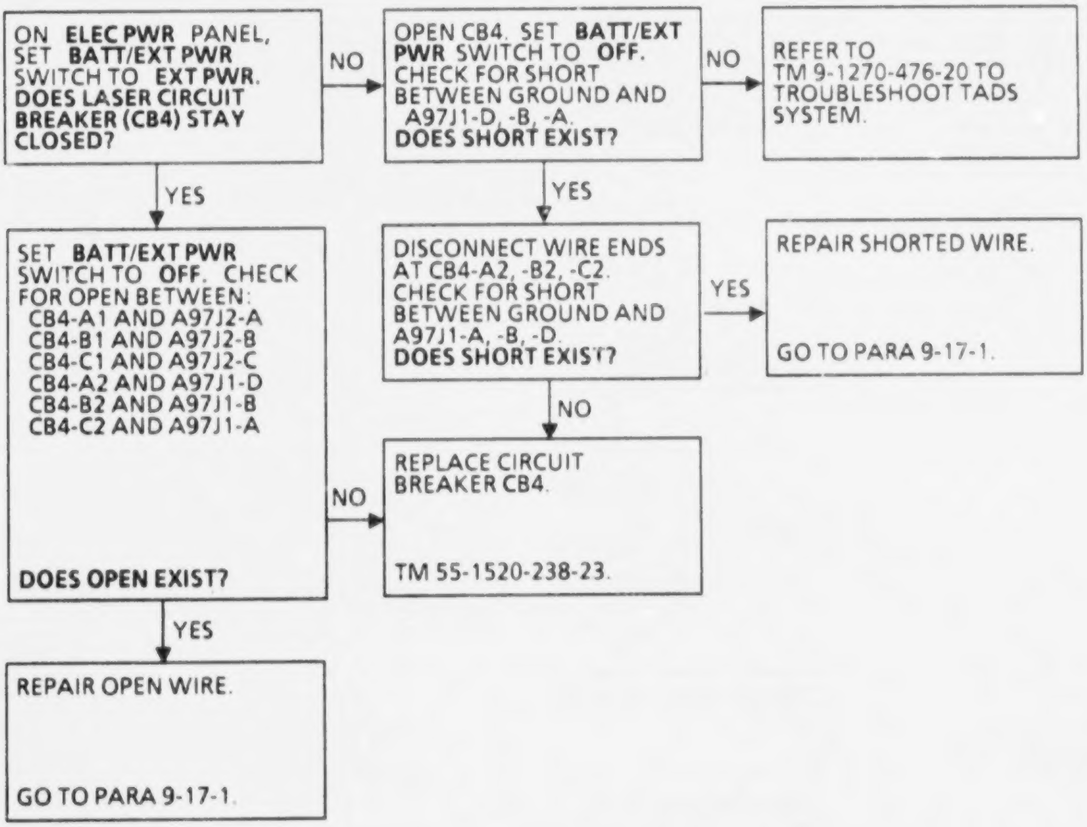
References:

TM 55-1520-238-23
TM 9-1270-476-20

Equipment Conditions: (para 9-17-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LASER CIRCUIT BREAKER (CB4) STAY CLOSED?
NO
OPEN CB4. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A97J1-D, -B, -A. DOES SHORT EXIST?
NO
REFER TO TM 9-1270-476-20 TO TROUBLESHOOT TADS SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB4-A1 AND A97J2-A CB4-B1 AND A97J2-B CB4-C1 AND A97J2-C CB4-A2 AND A97J1-D CB4-B2 AND A97J1-B CB4-C2 AND A97J1-A DOES OPEN EXIST?
YES
DISCONNECT WIRE ENDS AT CB4-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A97J1-A, -B, -D. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-17-1.
NO
NO
REPLACE CIRCUIT BREAKER CB4. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-17-1.

END OF TASK

9-17-15. TADS AC CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR 115 VAC TO TADS POWER SUPPLY AND ORT IS NOT PRESENT AT A97K1-H, -F, -E

Tools: (para 9-17-13)

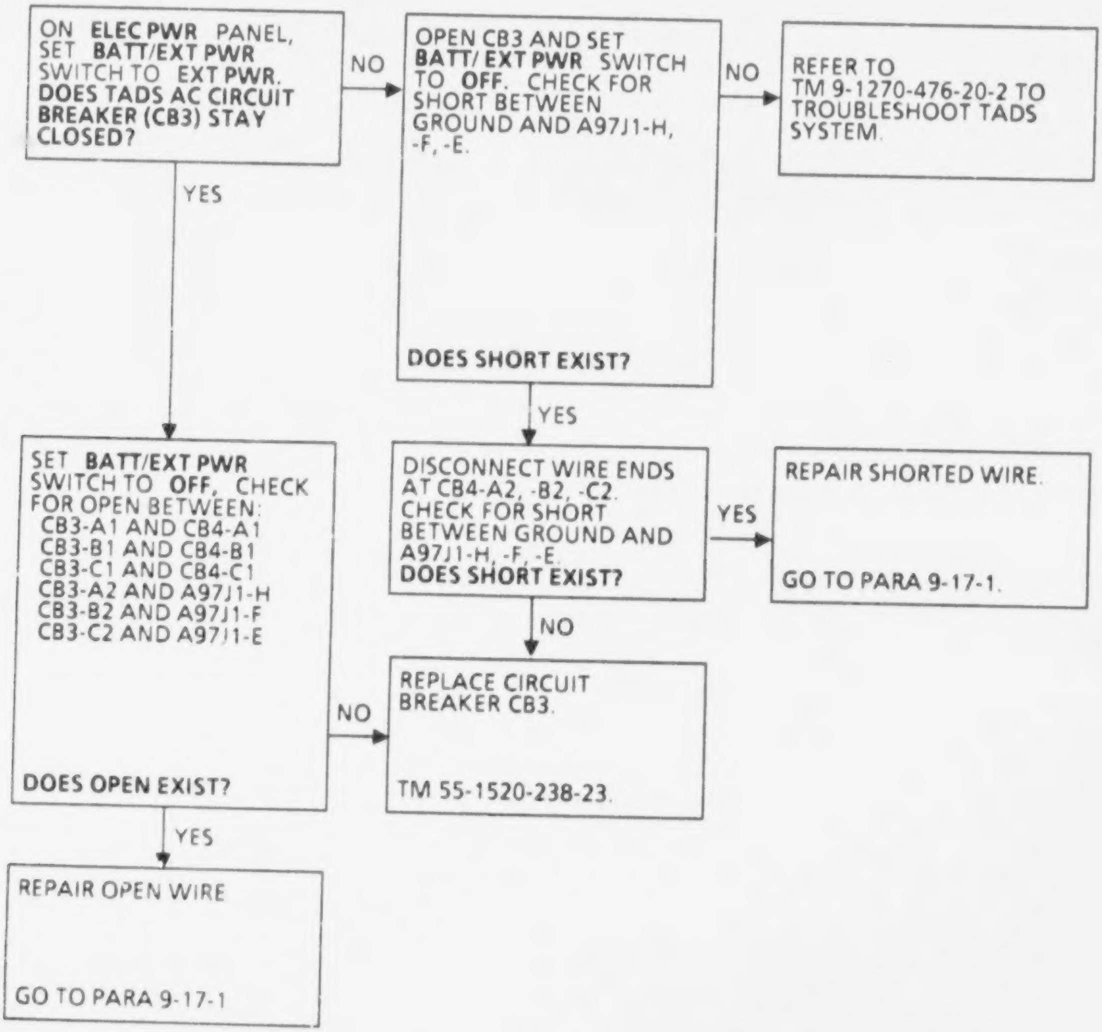
Personnel Required: (para 9-17-13)

References: (para 9-17-14)

Equipment Conditions: (para 9-17-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES TADS AC CIRCUIT BREAKER (CB3) STAY CLOSED?**

OPEN CB3 AND SET **BATT/ EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A97J1-H, -F, -E. **DOES SHORT EXIST?**

REFER TO TM 9-1270-476-20-2 TO TROUBLESHOOT TADS SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB3-A1 AND CB4-A1
CB3-B1 AND CB4-B1
CB3-C1 AND CB4-C1
CB3-A2 AND A97J1-H
CB3-B2 AND A97J1-F
CB3-C2 AND A97J1-E
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB4-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A97J1-H, -F, -E. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE. GO TO PARA 9-17-1.

REPLACE CIRCUIT BREAKER CB3. TM 55-1520-238-23.

REPAIR OPEN WIRE. GO TO PARA 9-17-1

END OF TASK

9-17-16. IHADSS CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED OR 115 VAC TO IHADSS SEU IS NOT PRESENT AT A97P1-E, -D, -C

Tools: (para 9-17-13)

Personnel Required: (para 9-17-13)

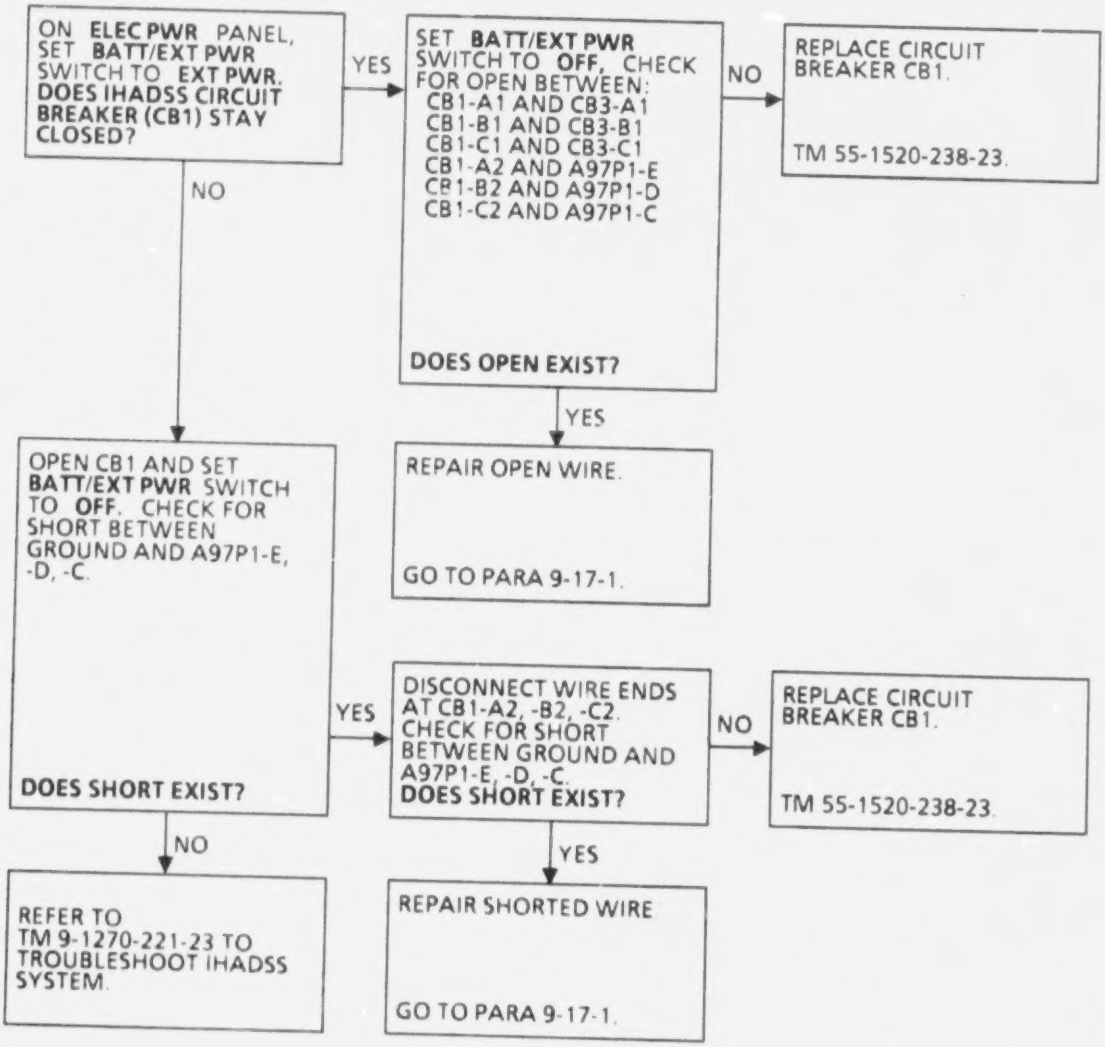
References:

TM 55-1520-238-23
TM 9-1270-221-23

Equipment Conditions: (para 9-17-13)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES IHADSS CIRCUIT BREAKER (CB1) STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB1-A1 AND CB3-A1
CB1-B1 AND CB3-B1
CB1-C1 AND CB3-C1
CB1-A2 AND A97P1-E
CB1-B2 AND A97P1-D
CB1-C2 AND A97P1-C

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB1.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-17-1.

OPEN CB1 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A97P1-E, -D, -C.

DOES SHORT EXIST?

DISCONNECT WIRE ENDS AT CB1-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A97P1-E, -D, -C. **DOES SHORT EXIST?**

REPLACE CIRCUIT BREAKER CB1.

TM 55-1520-238-23.

REFER TO TM 9-1270-221-23 TO TROUBLESHOOT IHADSS SYSTEM.

REPAIR SHORTED WIRE.

GO TO PARA 9-17-1.

END OF TASK

9-17-17. CONTINUITY DOES NOT EXIST BETWEEN A77J4-L AND A77J2-35

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

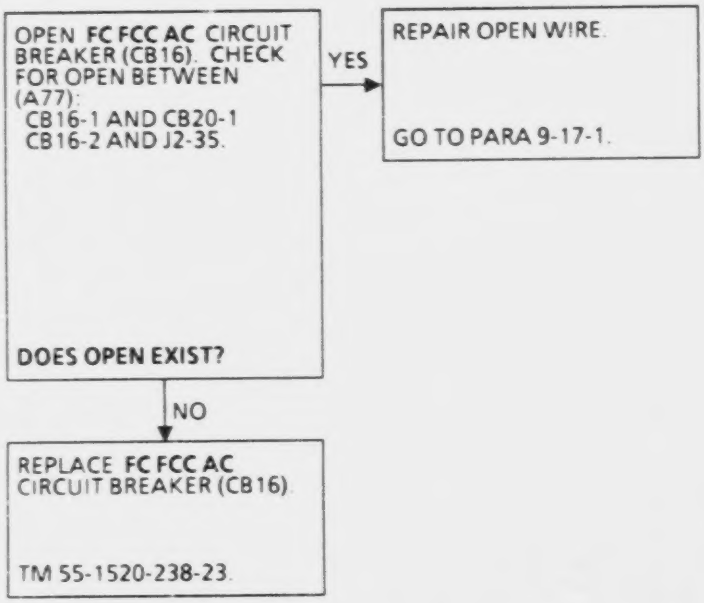
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN **FC FCC AC** CIRCUIT BREAKER (CB16). CHECK FOR OPEN BETWEEN (A77):
CB16-1 AND CB20-1
CB16-2 AND J2-35.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-17-1.
NO
REPLACE **FC FCC AC** CIRCUIT BREAKER (CB16).
TM 55-1520-238-23.

END OF TASK

9-17-18. CONTINUITY DOES NOT EXIST BETWEEN A77J4-L AND A77J1-6

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

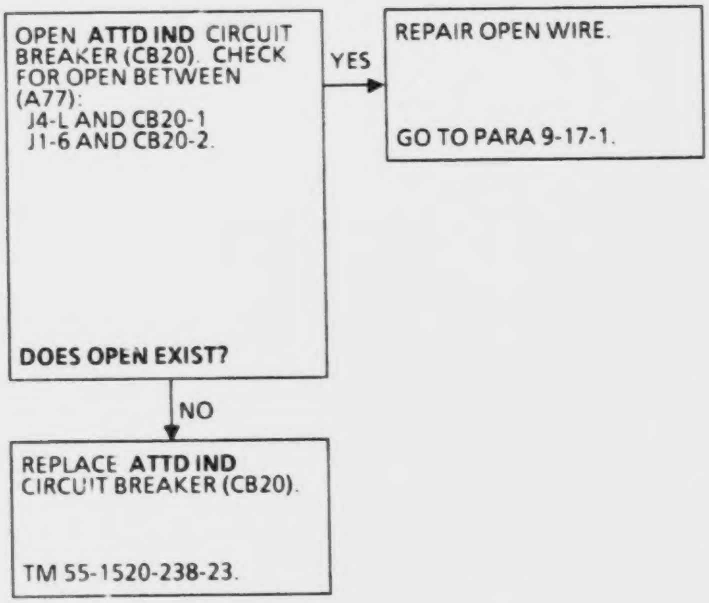
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN **ATTD IND** CIRCUIT BREAKER (CB20). CHECK FOR OPEN BETWEEN (A77):
J4-L AND CB20-1
J1-6 AND CB20-2.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-17-1.

REPLACE **ATTD IND** CIRCUIT BREAKER (CB20).

TM 55-1520-238-23.

END OF TASK

9-18-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

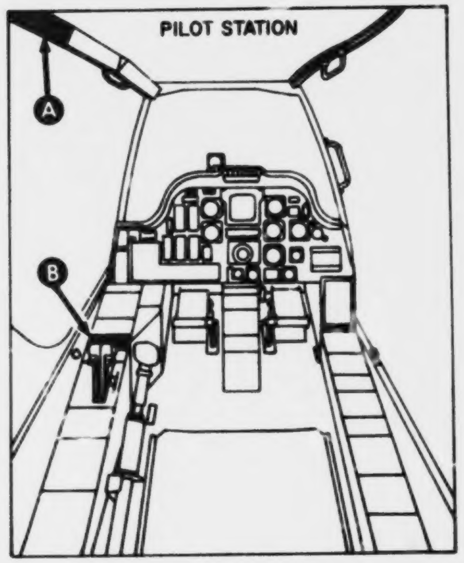
TM 55-1520-238-23

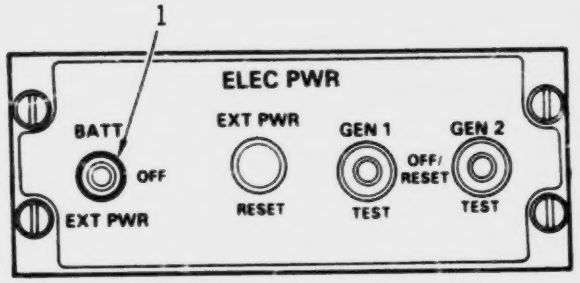
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

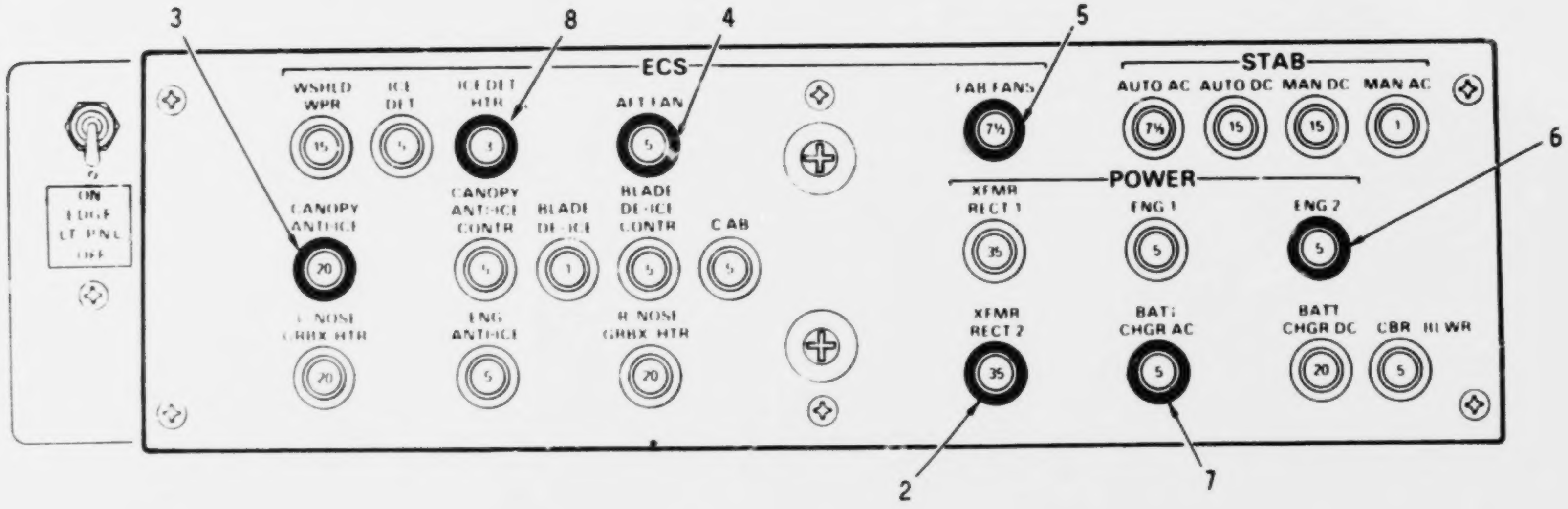
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.





B PILOT ELEC PWR PANEL



A PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1008E

GO TO NEXT PAGE

9-18-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) OPERATIONAL CHECK (cont)

A. Disconnect A76P3 and A76P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P3-D, -E, -F; A76P4-A, -B, -C.	If short exists, go to para 9-18-4.
2. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
3. Check for 115 VAC at J3-D, -E, -F.	If 115 VAC is not present, go to para 9-2-1.
4. Check for 115 VAC at J4-A, -B, -C.	If 115 VAC is not present, go to para 9-2-1.
5. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect P3.	
6. Check for continuity to transformer rectifier no. 2 between P4-A and -D, P4-B and -E, P4-C and -F.	If continuity does not exist, go to para 9-18-5.
7. With P4 connected, check that following circuit breakers are closed. **POWER XFMR RECT 2** (CB4) (2) **ECS CANOPY ANTI ICE** (CB78) (3) **ECS AFT FAN** (CB75) (4) **ECS FAB FANS** (CB88) (5) **POWER ENG 2** (CB44) (6) **POWER BATT CHGR AC** (CB86) (7) **ECS ICE DET HTR** (CB212) (8)	
8. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
9. Check that circuit breakers closed in step 7 remain closed.	If CB4 (2) does not stay closed, go to para 9-18-5. If CB78 (3) does not stay closed, go to para 9-18-6. If CB75 (4) does not stay closed, go to para 9-18-7. If CB88 (5) does not stay closed, go to para 9-18-8. If CB44 (6) does not stay closed, go to para 9-18-9. If CB86 (7) does not stay closed, go to para 9-18-10. If CB212 (8) does not stay closed, go to para 9-18-11.
10. With **BATT/EXT PWR** switch (1) set to **OFF**, disconnect A76P1 and A76P2.	
11. With **BATT/EXT PWR** switch (1) set to **EXT PWR**, check for 115 VAC to canopy temperature control at P2-c, -d, -e.	If 115 VAC is not present, go to para 9-18-6.
12. Check for 115 VAC to electrical power distribution box and aft avionics bay fans at P2-A, -B, -C.	If 115 VAC is not present, go to para 9-18-7.
13. Check for 115 VAC to FAB fan relays at P2-K, -L, -M.	If 115 VAC is not present, go to para 9-18-8.
14. Check for 115 VAC to engine no. 2 power transformer at P1-23.	If 115 VAC is not present, go to para 9-18-9.
15. Check for 115 VAC to battery charger and heater kit at P1-35.	If 115 VAC is not present, go to para 9-18-10.
16. Check for 115 VAC to ice detector sensor at P1-9.	If 115 VAC is not present, go to para 9-18-11.

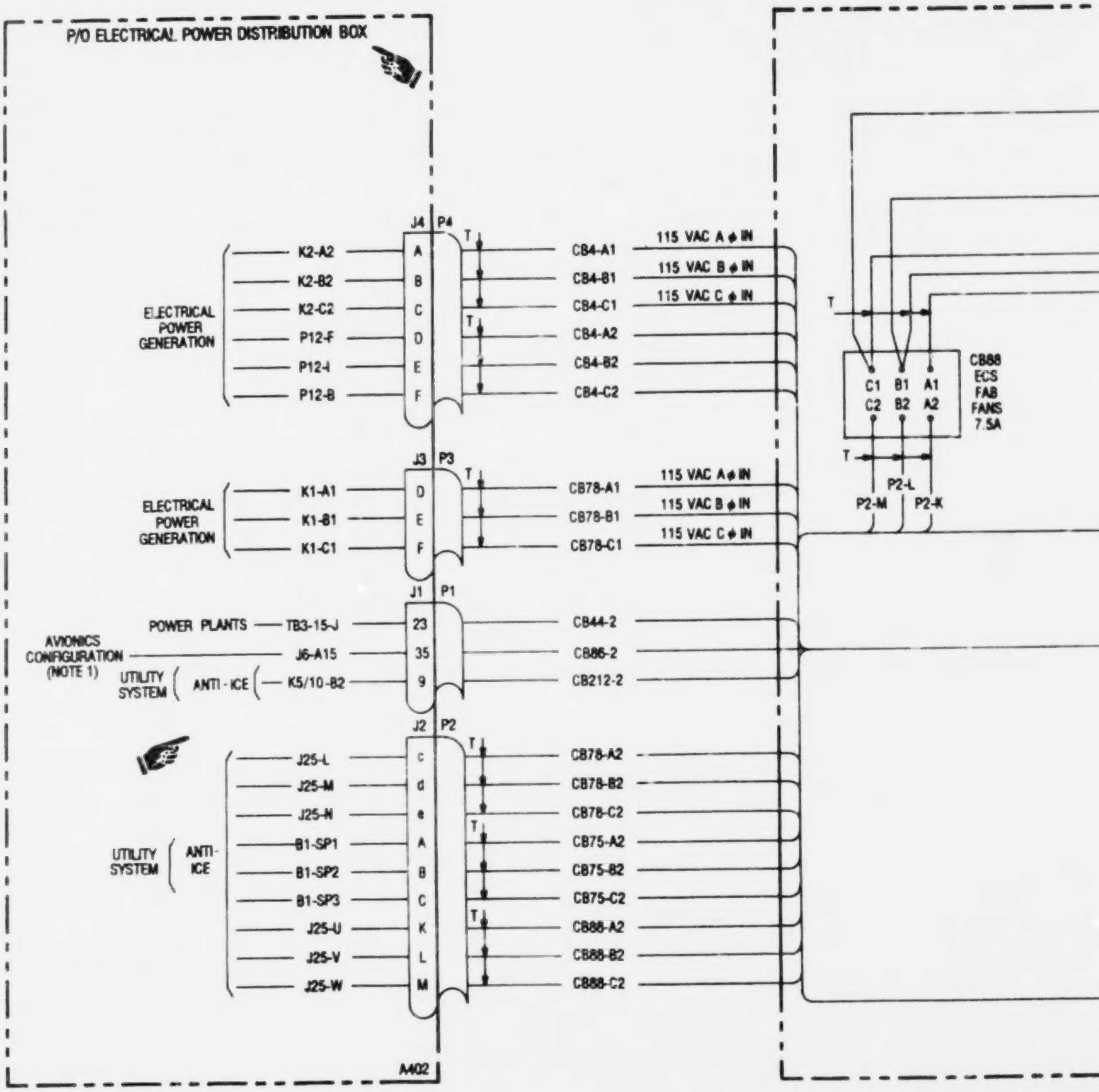
C. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **OFF**.

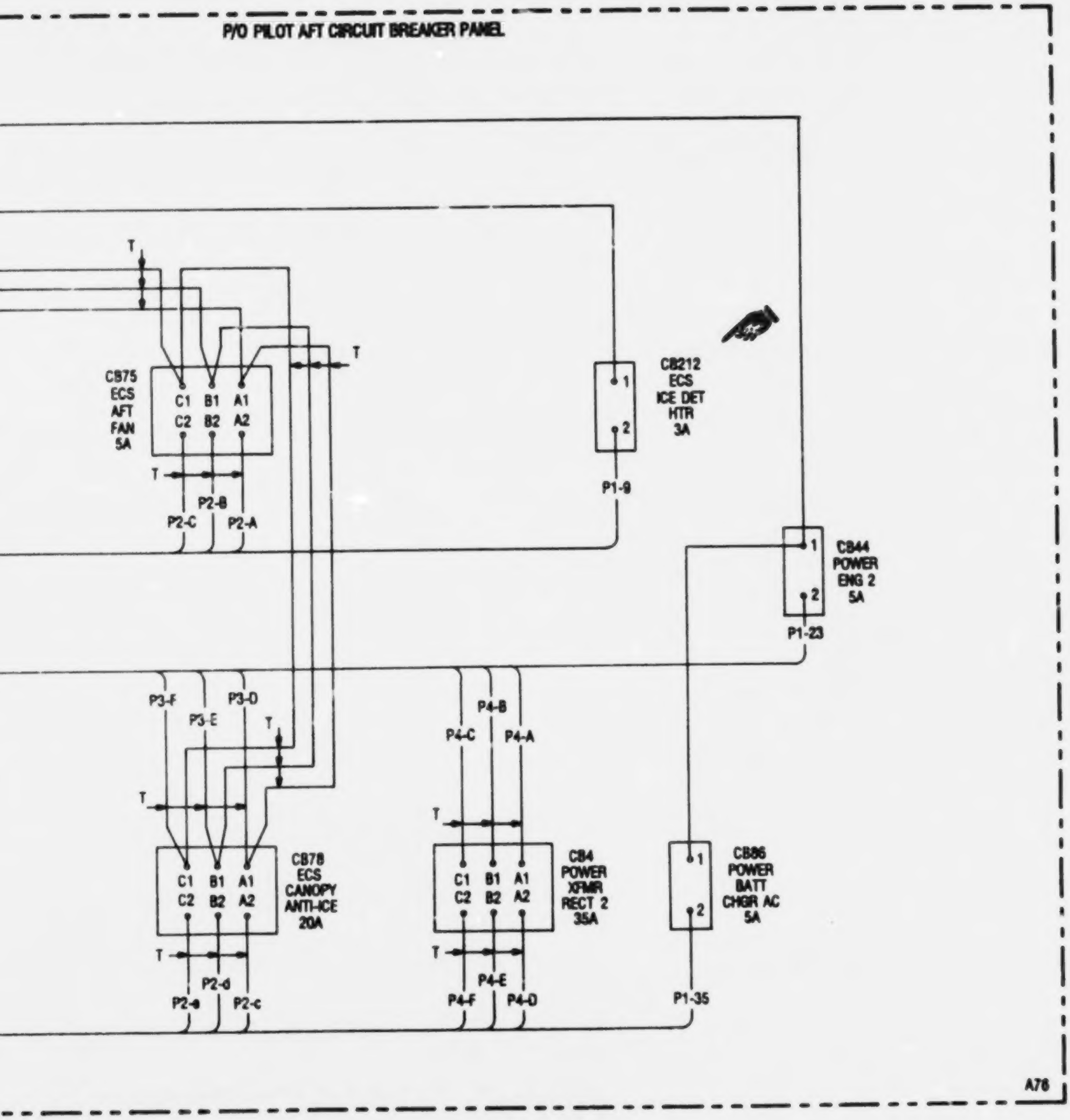
D. Reconnect A76P1 and A76P2.

E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-18-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) - INTERCONNECTION DIAGRAM

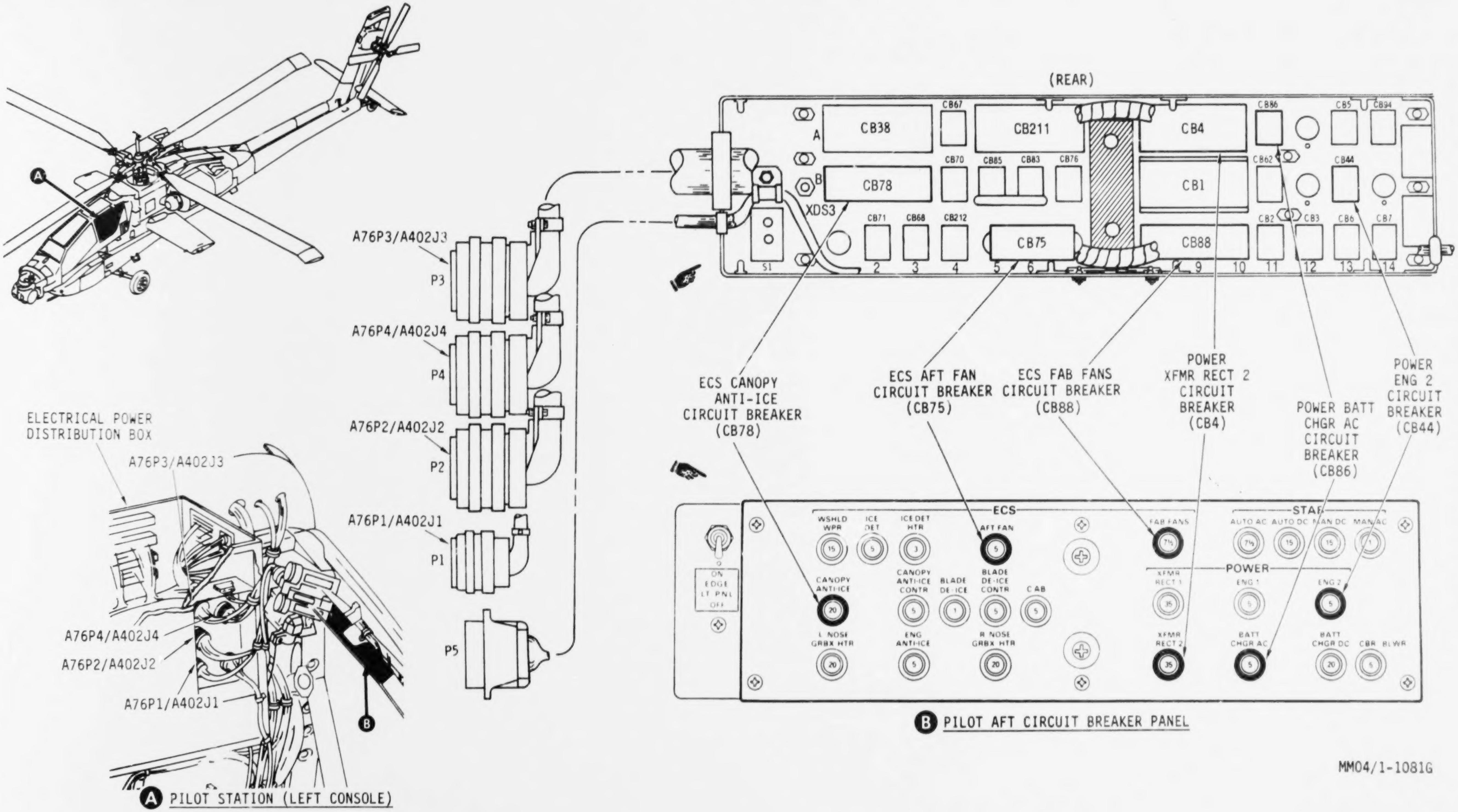




NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

9-18-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



A PILOT STATION (LEFT CONSOLE)

B PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1081G

9-18-4. A SHORT EXISTS BETWEEN GROUND AND A76P3-D, -E, -F OR A76P4-A, -B, -C

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

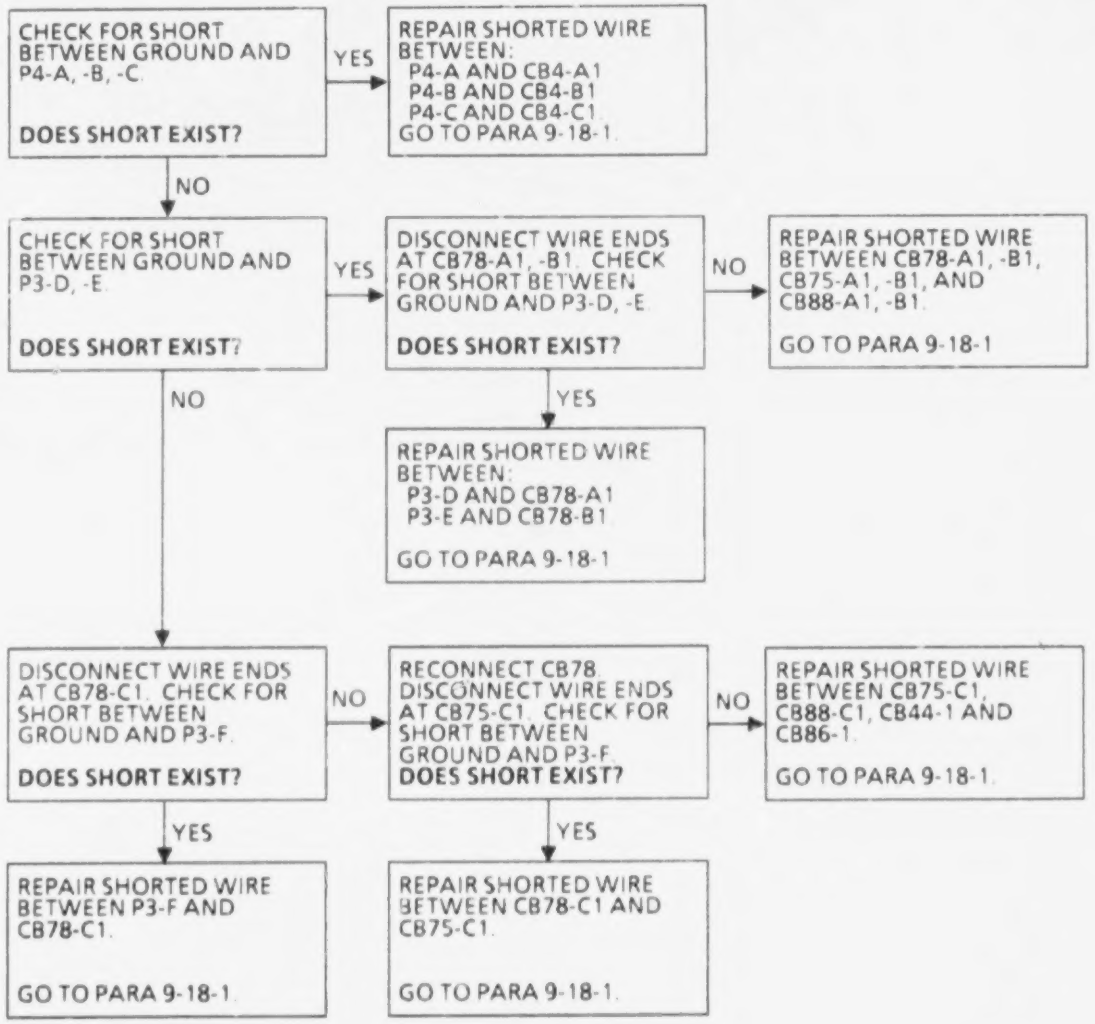
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-16-1	All AC essential bus 2 pilot station circuit breakers open


CHECK FOR SHORT BETWEEN GROUND AND P4-A, -B, -C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN: P4-A AND CB4-A1 P4-B AND CB4-B1 P4-C AND CB4-C1. GO TO PARA 9-18-1.
NO
CHECK FOR SHORT BETWEEN GROUND AND P3-D, -E. DOES SHORT EXIST?
YES
DISCONNECT WIRE ENDS AT CB78-A1, -B1. CHECK FOR SHORT BETWEEN GROUND AND P3-D, -E. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN CB78-A1, -B1, CB75-A1, -B1, AND CB88-A1, -B1. GO TO PARA 9-18-1
YES
REPAIR SHORTED WIRE BETWEEN: P3-D AND CB78-A1 P3-E AND CB78-B1. GO TO PARA 9-18-1
NO
DISCONNECT WIRE ENDS AT CB78-C1. CHECK FOR SHORT BETWEEN GROUND AND P3-F. DOES SHORT EXIST?
NO
RECONNECT CB78. DISCONNECT WIRE ENDS AT CB75-C1. CHECK FOR SHORT BETWEEN GROUND AND P3-F. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN CB75-C1, CB88-C1, CB44-1 AND CB86-1. GO TO PARA 9-18-1.
YES
REPAIR SHORTED WIRE BETWEEN P3-F AND CB78-C1. GO TO PARA 9-18-1.
YES
REPAIR SHORTED WIRE BETWEEN CB78-C1 AND CB75-C1. GO TO PARA 9-18-1.

END OF TASK

9-18-5. POWER XFMR RECT 2 CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED OR CONTINUITY TO TRANSFORMER RECTIFIER NO. 2 DOES NOT EXIST BETWEEN P4-A AND -D; -B AND -E; -C AND -F

Tools: (para 9-18-4)

Personnel Required: (para 9-18-4)

References: (para 9-18-4)

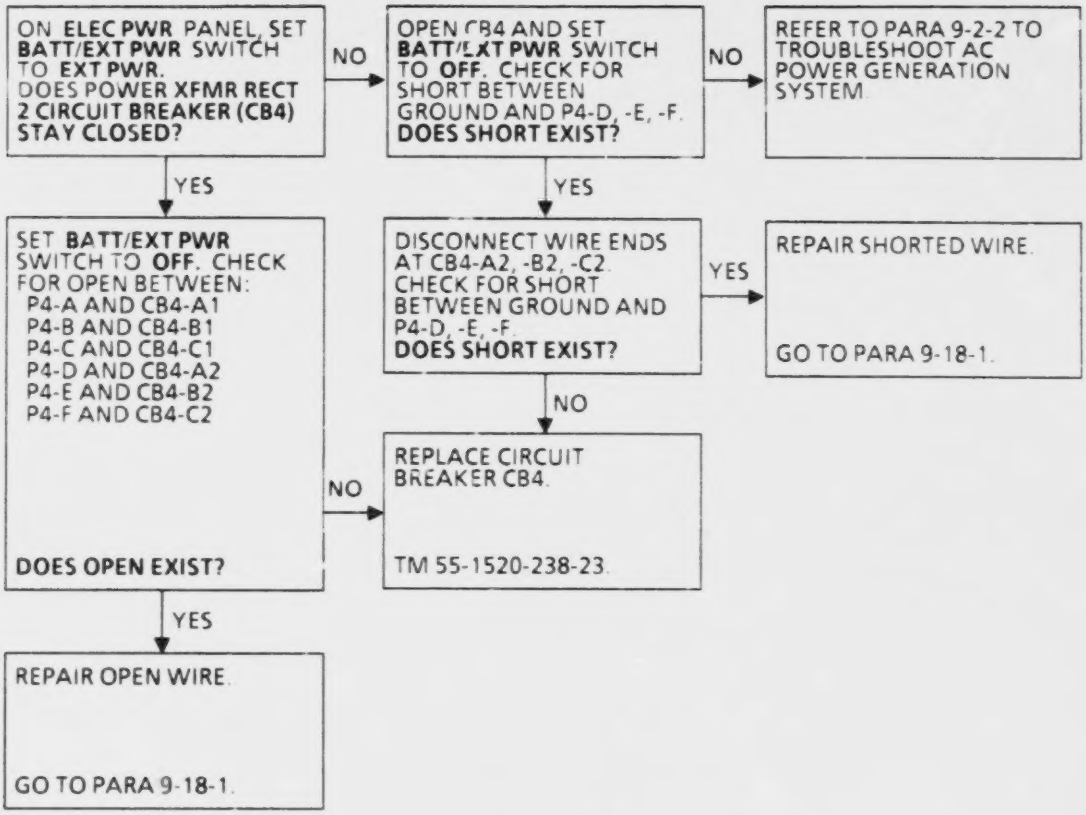
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

9-18-5



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** DOES POWER **XFMR RECT 2 CIRCUIT BREAKER (CB4) STAY CLOSED?**

OPEN CB4 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND P4-D, -E, -F. **DOES SHORT EXIST?**

REFER TO PARA 9-2-2 TO TROUBLESHOOT AC POWER GENERATION SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR OPEN BETWEEN:
- P4-A AND CB4-A1
- P4-B AND CB4-B1
- P4-C AND CB4-C1
- P4-D AND CB4-A2
- P4-E AND CB4-B2
- P4-F AND CB4-C2

DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB4-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P4-D, -E, -F. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.

GO TO PARA 9-18-1.

REPLACE CIRCUIT BREAKER CB4.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-18-1.

END OF TASK

9-18-6. ECS CANOPY ANTI ICE CIRCUIT BREAKER (CB78) - DOES NOT STAY CLOSED OR 115 VAC TO CANOPY TEMPERATURE CONTROL IS NOT PRESENT AT P2-c, -d, -e

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

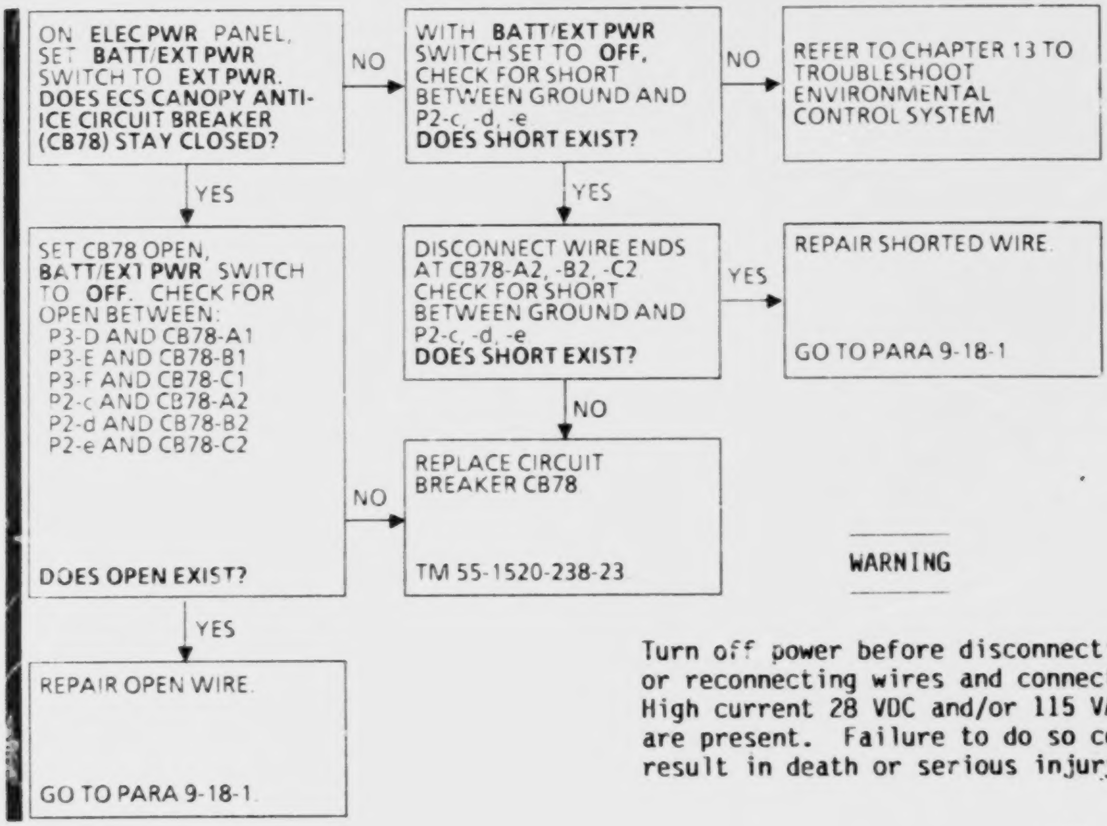
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS CANOPY ANTI-ICE CIRCUIT BREAKER (CB78) STAY CLOSED?
NO
WITH BATT/EXT PWR SWITCH SET TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P2-c, -d, -e DOES SHORT EXIST?
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ENVIRONMENTAL CONTROL SYSTEM
YES
YES
SET CB78 OPEN, BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
P3-D AND CB78-A1
P3-E AND CB78-B1
P3-F AND CB78-C1
P2-c AND CB78-A2
P2-d AND CB78-B2
P2-e AND CB78-C2
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB78-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-c, -d, -e DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-18-1
NO
NO
REPLACE CIRCUIT BREAKER CB78
TM 55-1520-238-23
YES
REPAIR OPEN WIRE.
GO TO PARA 9-18-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-18-7. ECS AFT FANS CIRCUIT BREAKER (CB75) - DOES NOT STAY CLOSED OR 115 VAC TO ELECTRICAL POWER CENTER AND AFT AVIONICS FANS IS NOT PRESENT AT P2-A, -B, -C

Tools: (para 9-18-6)

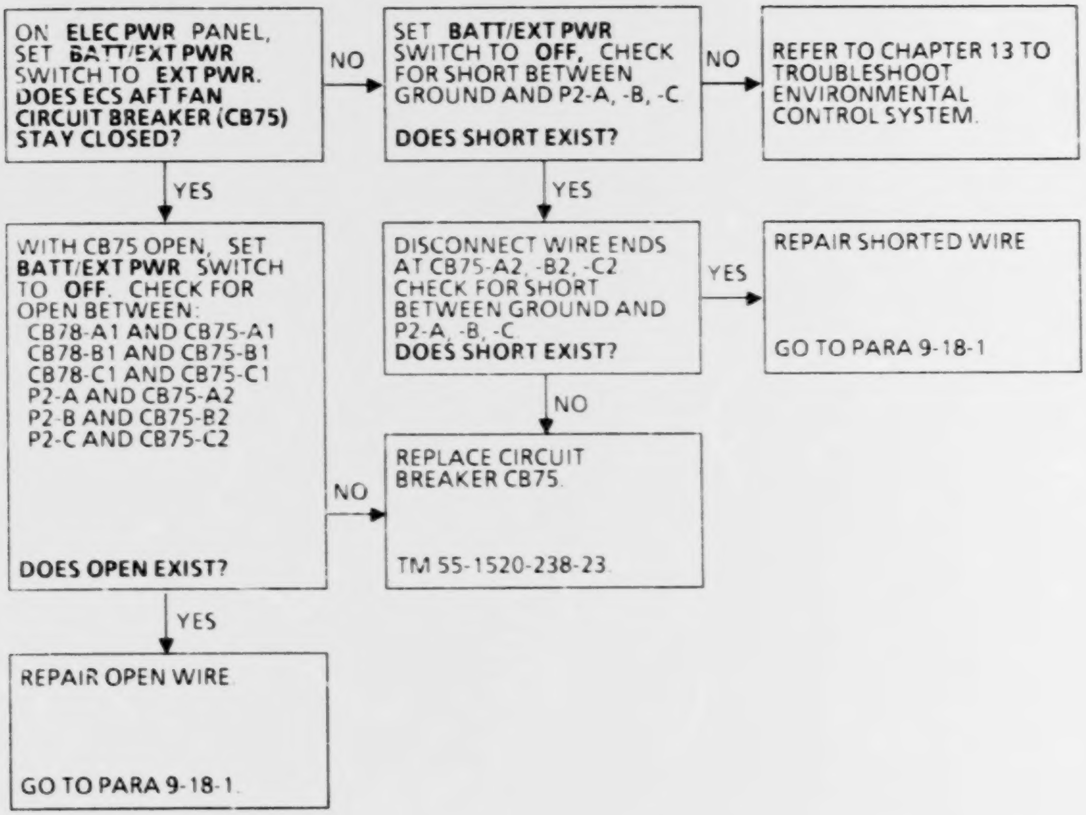
Personnel Required: (para 9-18-6)

References: (para 9-18-6)

Equipment Conditions: (para 9-18-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES ECS AFT FAN CIRCUIT BREAKER (CB75) STAY CLOSED?**
NO
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR SHORT BETWEEN GROUND AND P2-A, -B, -C. **DOES SHORT EXIST?**
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ENVIRONMENTAL CONTROL SYSTEM.
YES
YES
WITH CB75 OPEN, SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB78-A1 AND CB75-A1
CB78-B1 AND CB75-B1
CB78-C1 AND CB75-C1
P2-A AND CB75-A2
P2-B AND CB75-B2
P2-C AND CB75-C2
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB75-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-A, -B, -C. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE. GO TO PARA 9-18-1.
NO
NO
REPLACE CIRCUIT BREAKER CB75. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-18-1.

END OF TASK

9-18-8. ECS FAB FANS CIRCUIT BREAKER (CB88) - DOES NOT STAY CLOSED OR 115 VAC TO FAB FAN RELAYS IS NOT PRESENT AT P2-K, -L, -M

Tools: (para 9-18-6)

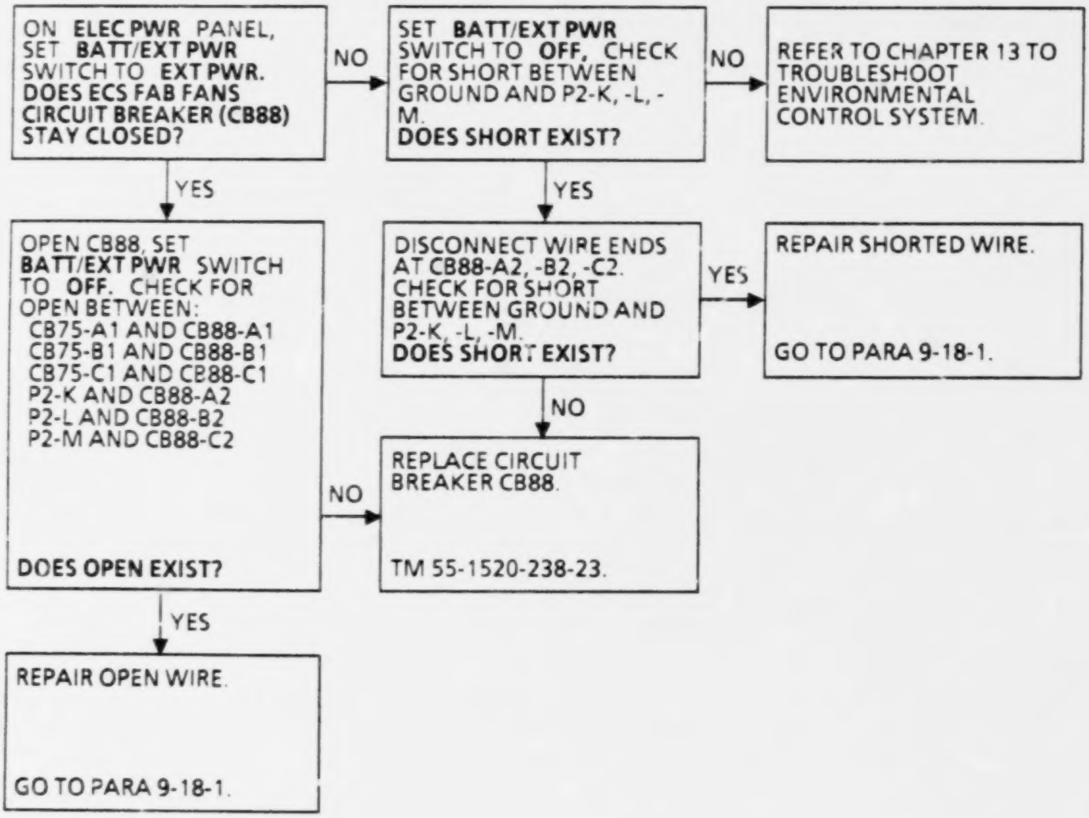
Personnel Required: (para 9-18-5)

References: (para 9-18-6)

Equipment Conditions: (para 9-18-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES ECS FAB FANS CIRCUIT BREAKER (CB88) STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR SHORT BETWEEN GROUND AND P2-K, -L, -M. **DOES SHORT EXIST?**

REFER TO CHAPTER 13 TO TROUBLESHOOT ENVIRONMENTAL CONTROL SYSTEM.

OPEN CB88, SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR OPEN BETWEEN:
CB75-A1 AND CB88-A1
CB75-B1 AND CB88-B1
CB75-C1 AND CB88-C1
P2-K AND CB88-A2
P2-L AND CB88-B2
P2-M AND CB88-C2
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB88-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND P2-K, -L, -M. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.

GO TO PARA 9-18-1.

REPLACE CIRCUIT BREAKER CB88.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-18-1.

END OF TASK

9-18-9. POWER ENG 2 CIRCUIT BREAKER (CB44) - DOES NOT STAY CLOSED OR 115 VAC TO ENGINE NO. 2 POWER TRANSFORMER IS NOT PRESENT AT P1-23

9-18-8/9-18-9

Tools: (para 9-18-6)

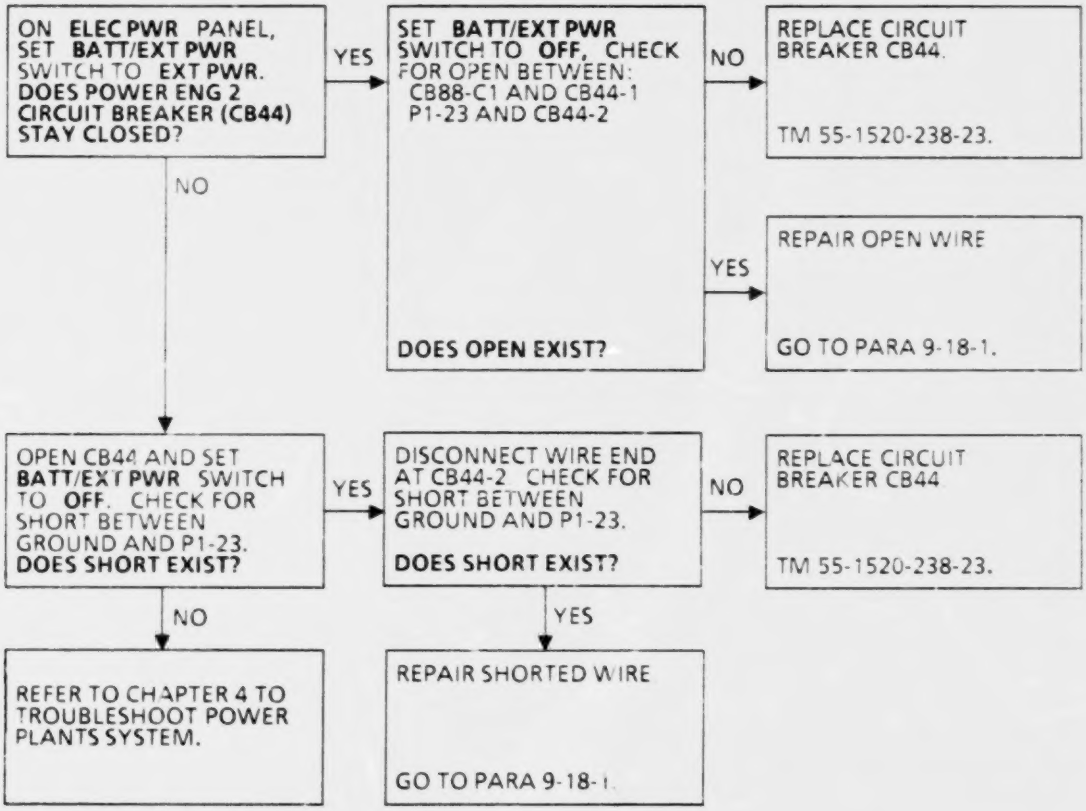
Personnel Required: (para 9-18-6)

References: (para 9-18-6)

Equipment Conditions: (para 9-18-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER ENG 2 CIRCUIT BREAKER (CB44) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB88-C1 AND CB44-1 P1-23 AND CB44-2 DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB44. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE GO TO PARA 9-18-1.
NO
OPEN CB44 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-23. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB44-2 CHECK FOR SHORT BETWEEN GROUND AND P1-23. DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB44 TM 55-1520-238-23.
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT POWER PLANTS SYSTEM.
YES
REPAIR SHORTED WIRE GO TO PARA 9-18-1.

END OF TASK

9-18-10. POWER BATT CHRGR AC CIRCUIT BREAKER (CB86) - DOES NOT STAY CLOSED OR 115 VAC TO BATTERY CHARGER AND HEATER IS NOT PRESENT AT P1-35

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

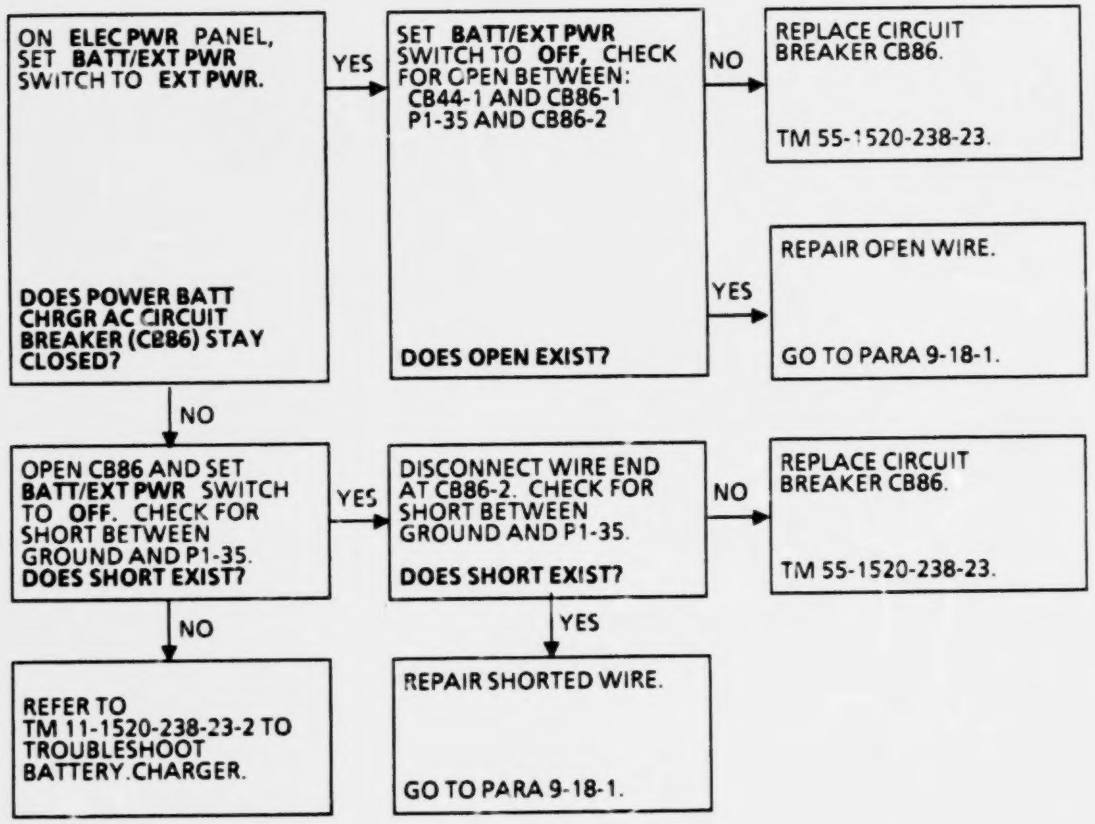
TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR.
DOES POWER BATT CHRGR AC CIRCUIT BREAKER (CB86) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB44-1 AND CB86-1 P1-35 AND CB86-2
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB86.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-18-1.
NO
OPEN CB86 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-35.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB86-2. CHECK FOR SHORT BETWEEN GROUND AND P1-35.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB86.
TM 55-1520-238-23.
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT BATTERY CHARGER.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-18-1.

END OF TASK

9-18-11. ECS ICE DET HTR CIRCUIT BREAKER (CB212) - DOES NOT STAY CLOSED OR 115 VAC IS NOT PRESENT AT A76P1-9

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

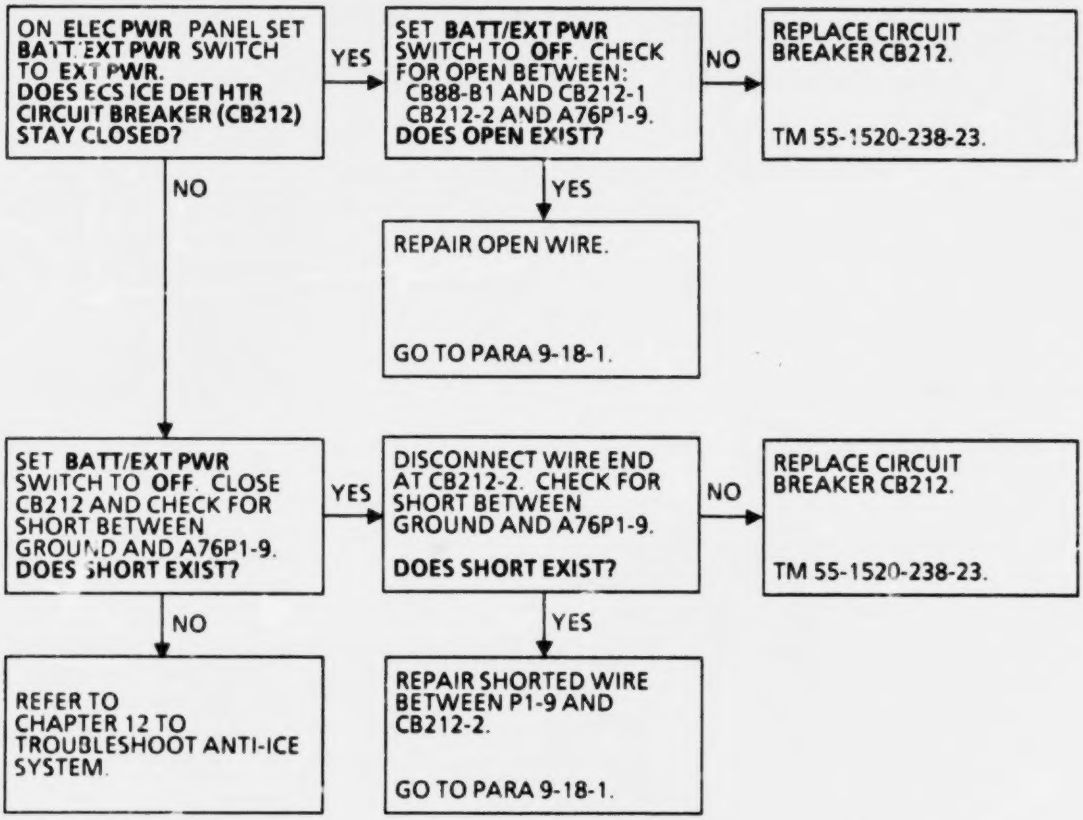
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL SET **BATT/EXT PWR** SWITCH TO **EXT PWR.**
DOES ECS ICE DET HTR CIRCUIT BREAKER (CB212) STAY CLOSED?

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB88-B1 AND CB212-1
CB212-2 AND A76P1-9.
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB212.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-18-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CLOSE CB212 AND CHECK FOR SHORT BETWEEN GROUND AND A76P1-9.
DOES SHORT EXIST?

DISCONNECT WIRE END AT CB212-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-9.

DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB212.

TM 55-1520-238-23.

REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

REPAIR SHORTED WIRE BETWEEN P1-9 AND CB212-2.

GO TO PARA 9-18-1.

END OF TASK

9-19-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

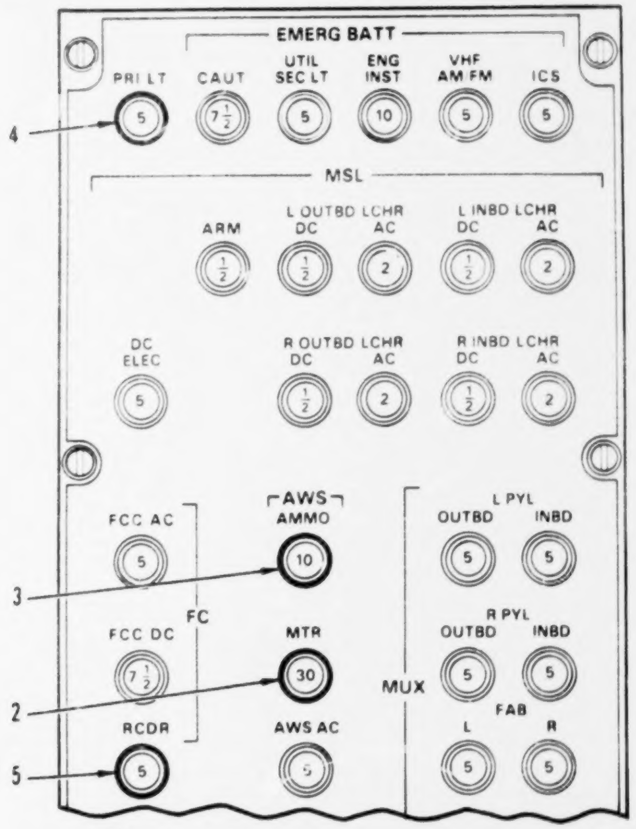
TM 55-1520-238-23

Equipment Conditions:

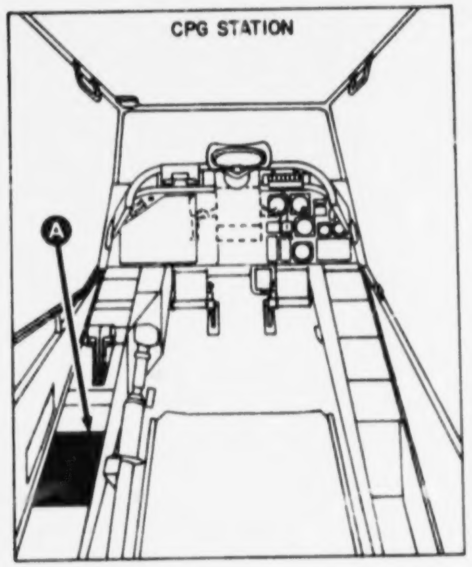
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panels removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

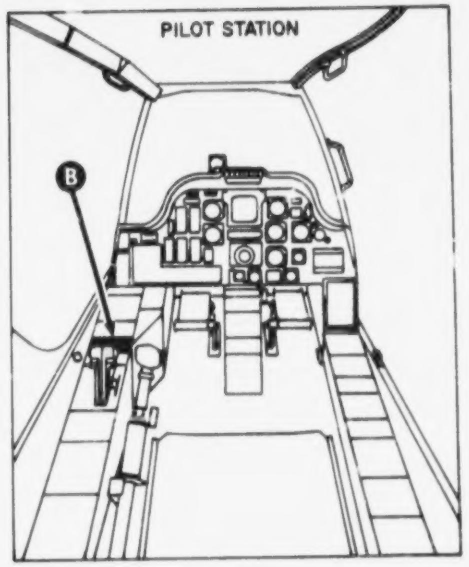
WARNING

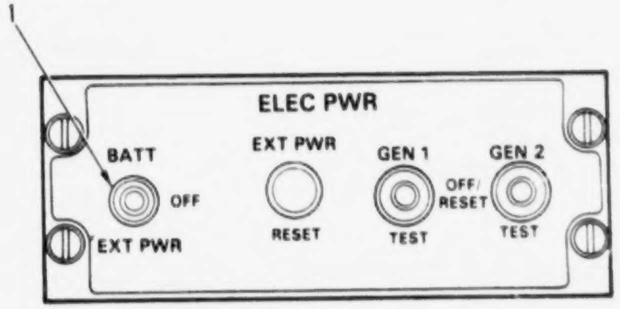
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



Ⓐ CPG CIRCUIT BREAKER PANEL NO. 1







Ⓑ PILOT ELEC PWR PANEL

MM04/1-1009A

GO TO NEXT PAG

9-19-1. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On CPG circuit breaker panel no. 1, check that **AWS MTR** (CB3) (2), **AWS AMMO** (CB7) (3), PRI LT (CB14) (4), and FC RCDR (CB8) (5) circuit breakers are closed.	
2. On ELEC PWR panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
3. Check that circuit breakers closed in step 1 remain closed.	If CB3 (2) does not stay closed, go to para 9-19-5. If CB7 (3) does not stay closed, go to para 9-19-6. If CB8 (5) does not stay closed, go to para 9-19-7. If CB14 (4) does not stay closed, go to para 9-19-8.
4. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
5. Remove CPG circuit breaker panel no. 1 (TM 55-1520-238-23).	
6. Disconnect P767 and P769.	
7. On ELEC **PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
8. Check for 115 VAC at P769-H, -B, -E.	If 115 VAC is not present, go to para 9-19-4.
9. On ELEC **PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
10. Check for continuity to gun control box between J4-H and J3-4, J4-B and J3-5, J4-E and J3-6.	If continuity does not exist, go to para 9-19-5.
11. Check for continuity to downloader and rounds counter between J4-H and J2-1, J4-B and J2-15, J4-E and J2-22.	If continuity does not exist, go to para 9-19-6.
12. Check for continuity to video recorder between J4-E and J2-16.	If continuity does not exist, go to para 9-19-7.
13. Check for continuity to multichannel dimmer between J4-H and J1-9.	If continuity does not exist, go to para 9-19-8.

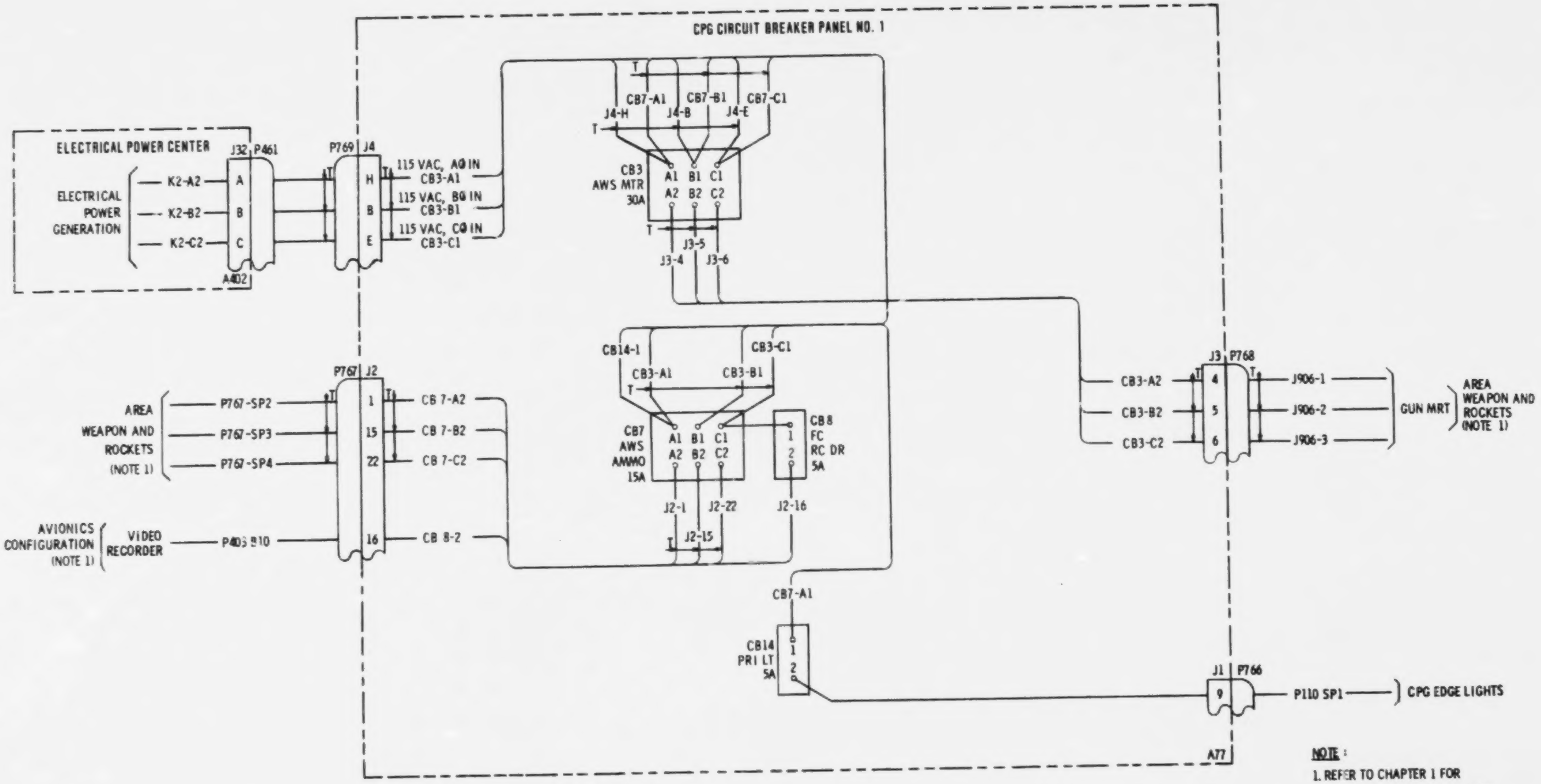
B. Reinstall CPG circuit breaker panel no. 1 (TM 55-1520-238-23).

C. Reconnect P767 and P769.

D. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

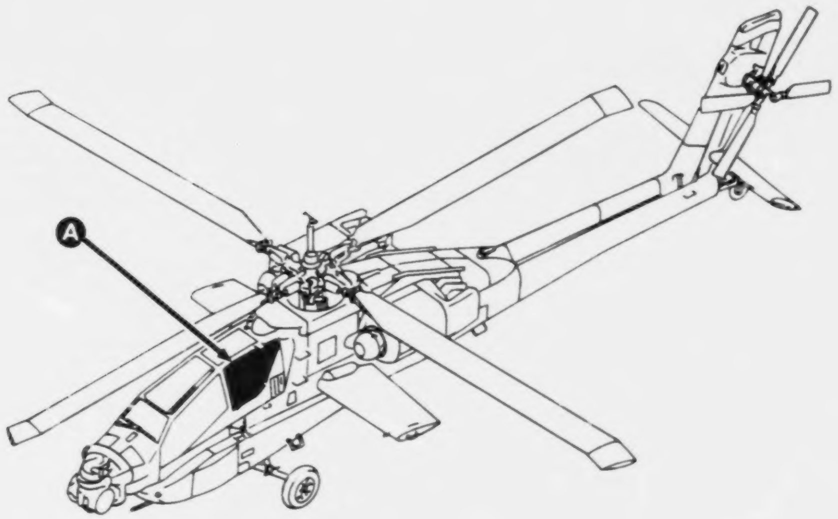
9-19-2. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) INTERCONNECTION DIAGRAM

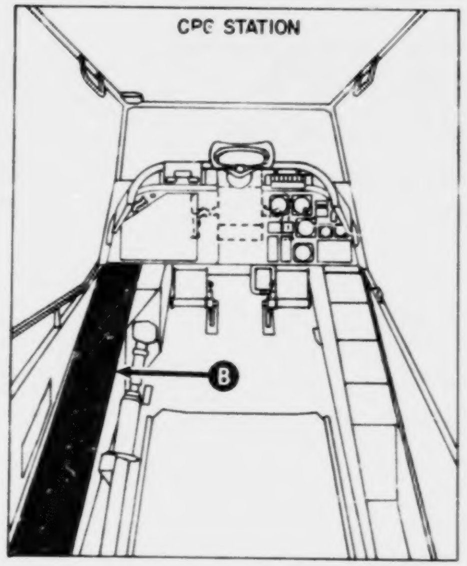


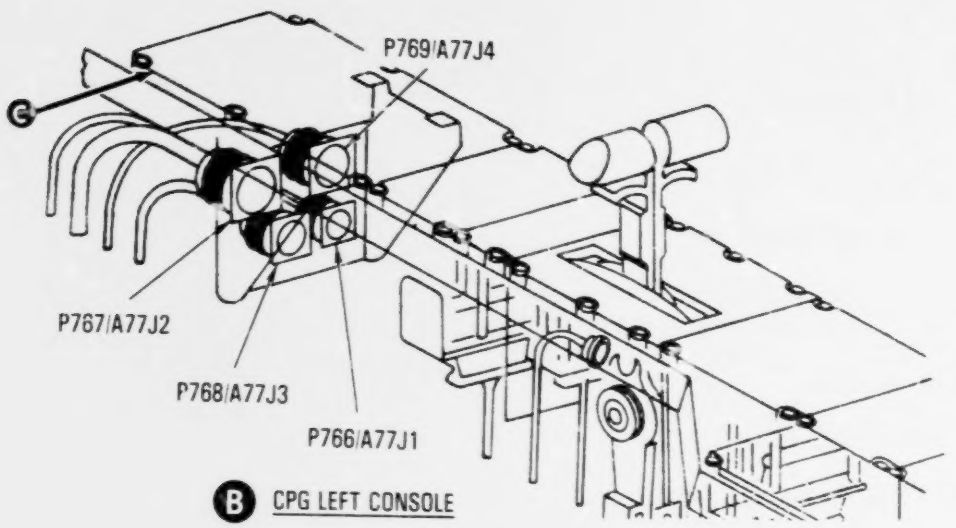
NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

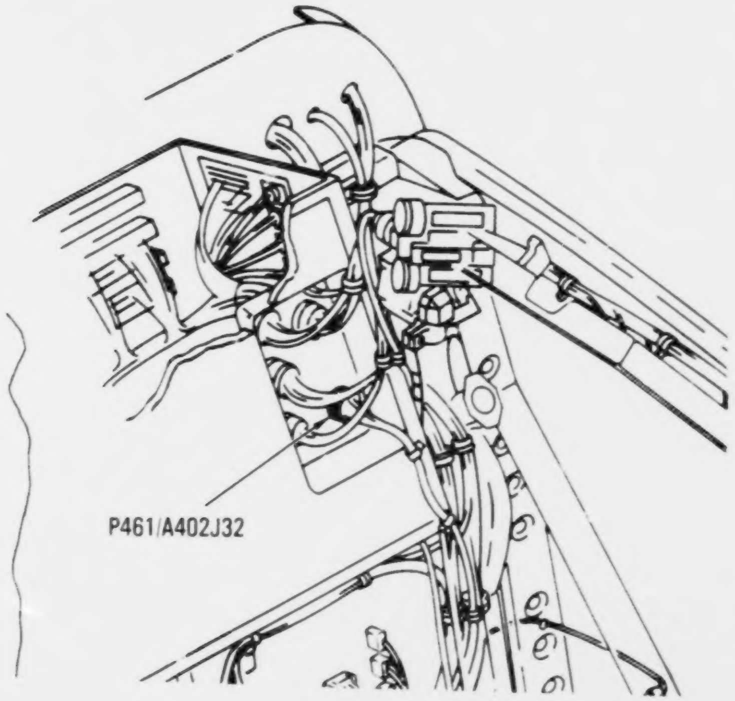
9-19-3. CIRCUIT PROTECTION SYSTEM (AC ESSENTIAL BUS 2 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



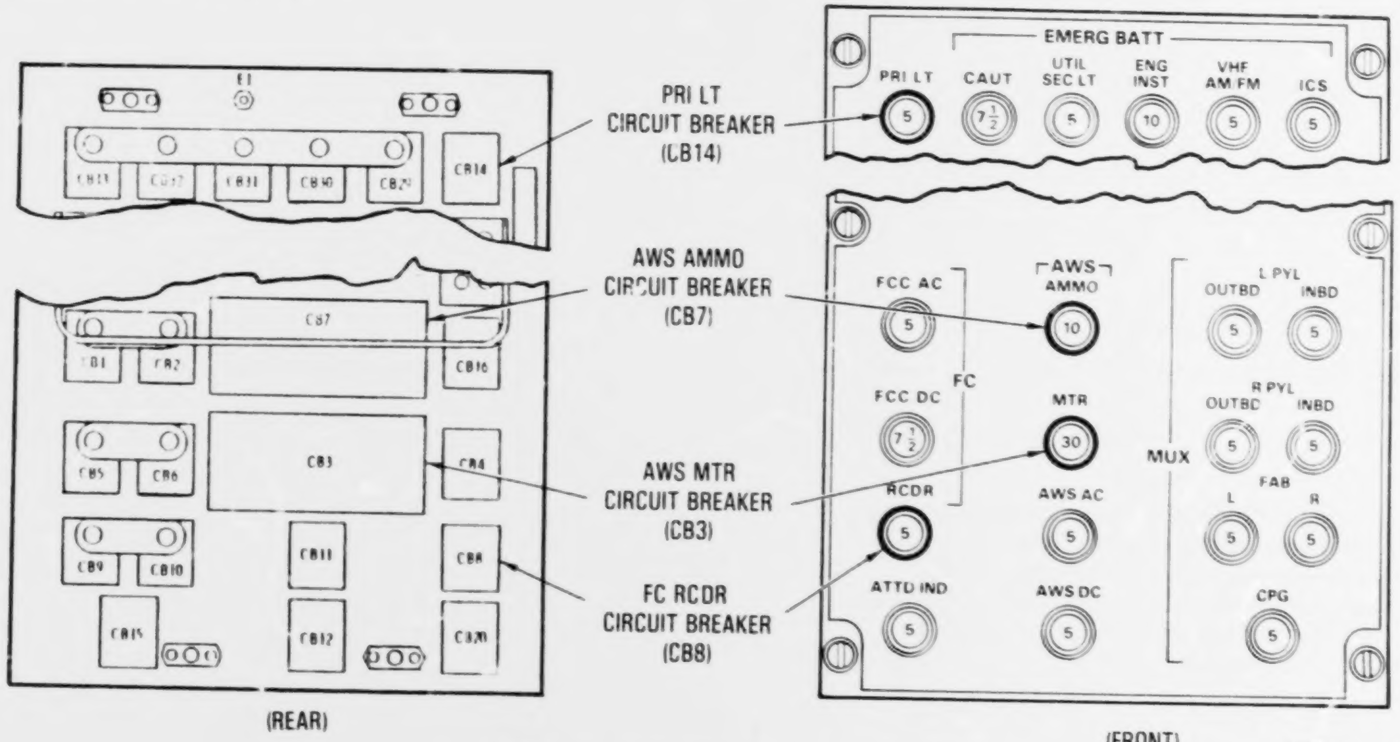




B CPG LEFT CONSOLE



A PILOT LEFT CONSOLE



C CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1113B

9-19-4. 115 VAC - IS NOT PRESENT AT P769-H, -B, -E

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

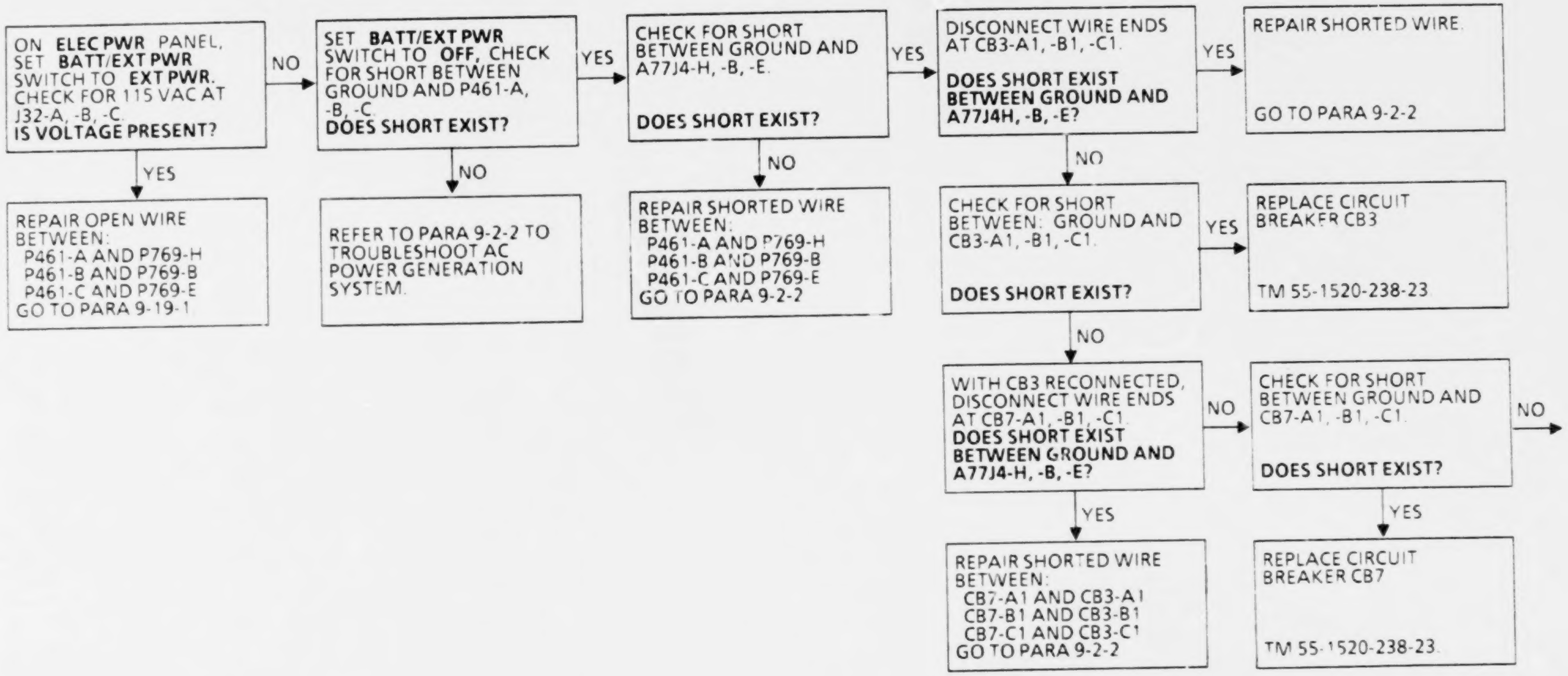
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-19-1	All AC essential bus 2 - CPG station circuit breakers open

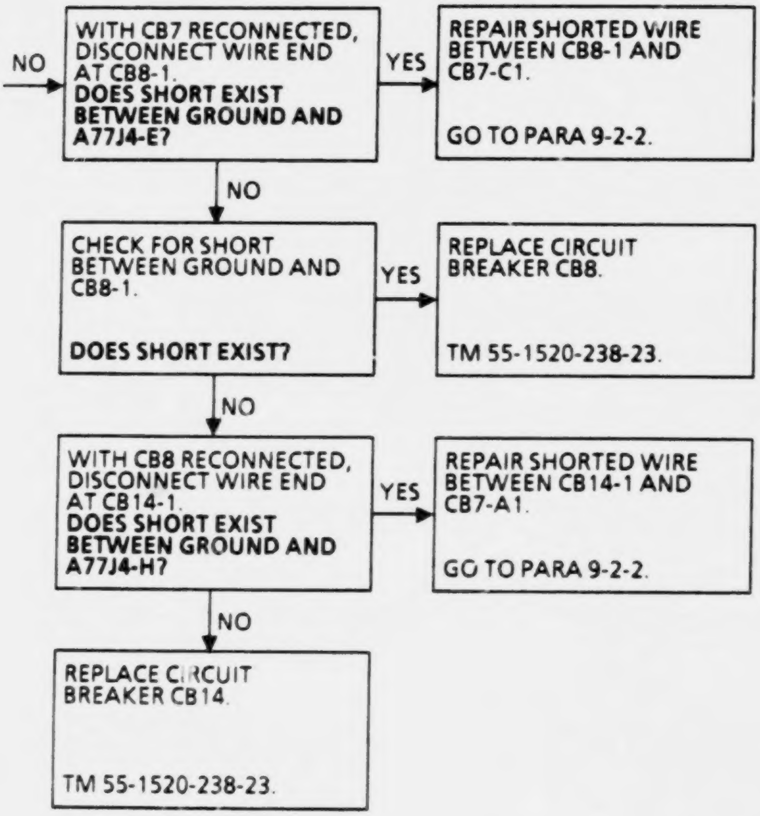
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. CHECK FOR 115 VAC AT J32-A, -B, -C. IS VOLTAGE PRESENT?
NO
YES
REPAIR OPEN WIRE BETWEEN: P461-A AND P769-H P461-B AND P769-B P461-C AND P769-E GO TO PARA 9-19-1
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P461-A, -B, -C DOES SHORT EXIST?
YES
NO
REFER TO PARA 9-2-2 TO TROUBLESHOOT AC POWER GENERATION SYSTEM.
CHECK FOR SHORT BETWEEN GROUND AND A77J4-H, -B, -E. DOES SHORT EXIST?
YES
NO
REPAIR SHORTED WIRE BETWEEN: P461-A AND P769-H P461-B AND P769-B P461-C AND P769-E GO TO PARA 9-2-2
DISCONNECT WIRE ENDS AT CB3-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A77J4H, -B, -E?
YES
NO
REPAIR SHORTED WIRE. GO TO PARA 9-2-2
CHECK FOR SHORT BETWEEN: GROUND AND CB3-A1, -B1, -C1. DOES SHORT EXIST?
YES
NO
REPLACE CIRCUIT BREAKER CB3 TM 55-1520-238-23
WITH CB3 RECONNECTED, DISCONNECT WIRE ENDS AT CB7-A1, -B1, -C1. DOES SHORT EXIST BETWEEN GROUND AND A77J4-H, -B, -E?
NO
YES
REPAIR SHORTED WIRE BETWEEN: CB7-A1 AND CB3-A1 CB7-B1 AND CB3-B1 CB7-C1 AND CB3-C1 GO TO PARA 9-2-2
CHECK FOR SHORT BETWEEN GROUND AND CB7-A1, -B1, -C1. DOES SHORT EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB7 TM 55-1520-238-23

GO TO NEXT PAGE

9-19-4. 115 VAC - IS NOT PRESENT AT P769-H, -B, -E (cont)


NO
WITH CB7 RECONNECTED, DISCONNECT WIRE END AT CB8-1. DOES SHORT EXIST BETWEEN GROUND AND A77J4-E?
YES
REPAIR SHORTED WIRE BETWEEN CB8-1 AND CB7-C1.
GO TO PARA 9-2-2.
NO
CHECK FOR SHORT BETWEEN GROUND AND CB8-1.
DOES SHORT EXIST?
YES
REPLACE CIRCUIT BREAKER CB8.
TM 55-1520-238-23.
NO
WITH CB8 RECONNECTED, DISCONNECT WIRE END AT CB14-1. DOES SHORT EXIST BETWEEN GROUND AND A77J4-H?
YES
REPAIR SHORTED WIRE BETWEEN CB14-1 AND CB7-A1.
GO TO PARA 9-2-2.
NO
REPLACE CIRCUIT BREAKER CB14.
TM 55-1520-238-23.

END OF TASK

9-19-5. AWS MTR CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR CONTINUITY TO GUN CONTROL BOX DOES NOT EXIST BETWEEN J4-H AND J3-4, J4-B AND J3-5, J4-E AND J3-6

Too's: (para 9-19-4)

Personnel Required: (para 9-19-4)

References:

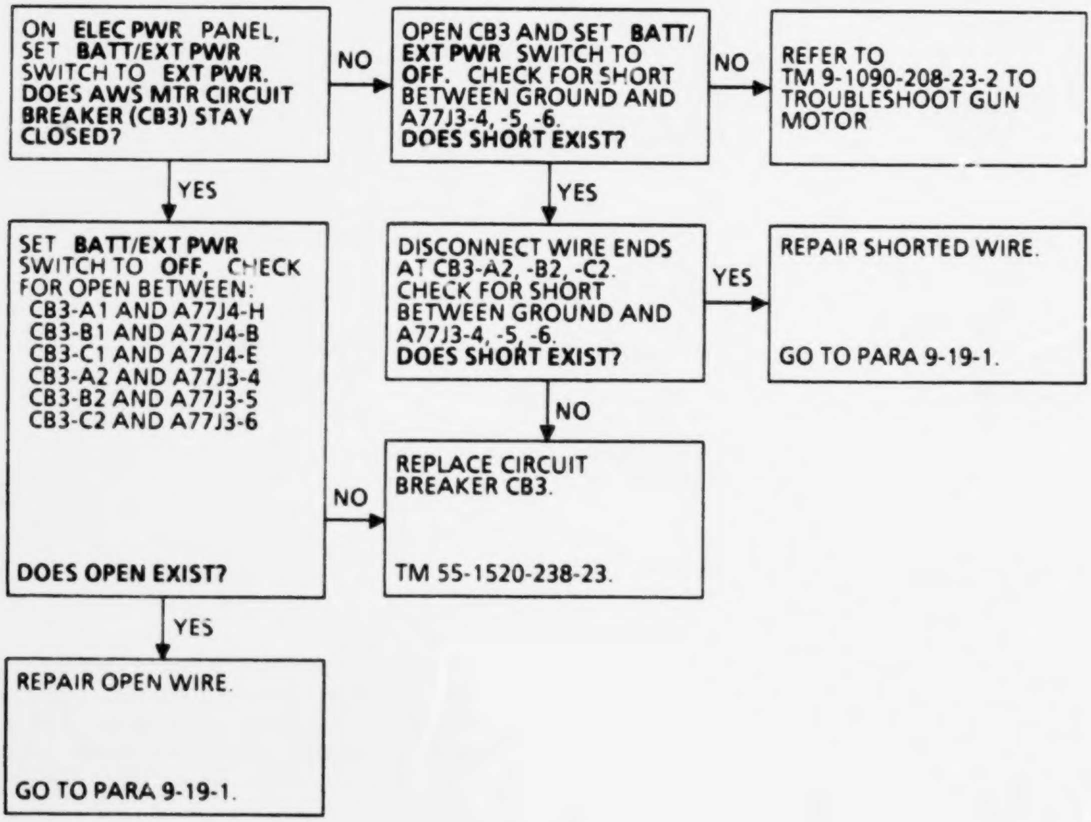
TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS MTR CIRCUIT BREAKER (CB3) STAY CLOSED?
NO
OPEN CB3 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J3-4, -5, -6. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT GUN MOTOR
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB3-A1 AND A77J4-H CB3-B1 AND A77J4-B CB3-C1 AND A77J4-E CB3-A2 AND A77J3-4 CB3-B2 AND A77J3-5 CB3-C2 AND A77J3-6 DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB3-A2, -B2, -C2. CHECK FOR SHORT BETWEEN GROUND AND A77J3-4, -5, -6. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-19-1.
NO
NO
REPLACE CIRCUIT BREAKER CB3. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-19-1.

END OF TASK

9-19-6. AWS AMMO CIRCUIT BREAKER (CB7) - DOES NOT STAY CLOSED OR CONTINUITY TO DOWNLOADER AND ROUNDS COUNTER DOES NOT EXIST BETWEEN J4-H AND J2-1, J4-B AND J2-15, J4-E AND J2-22

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

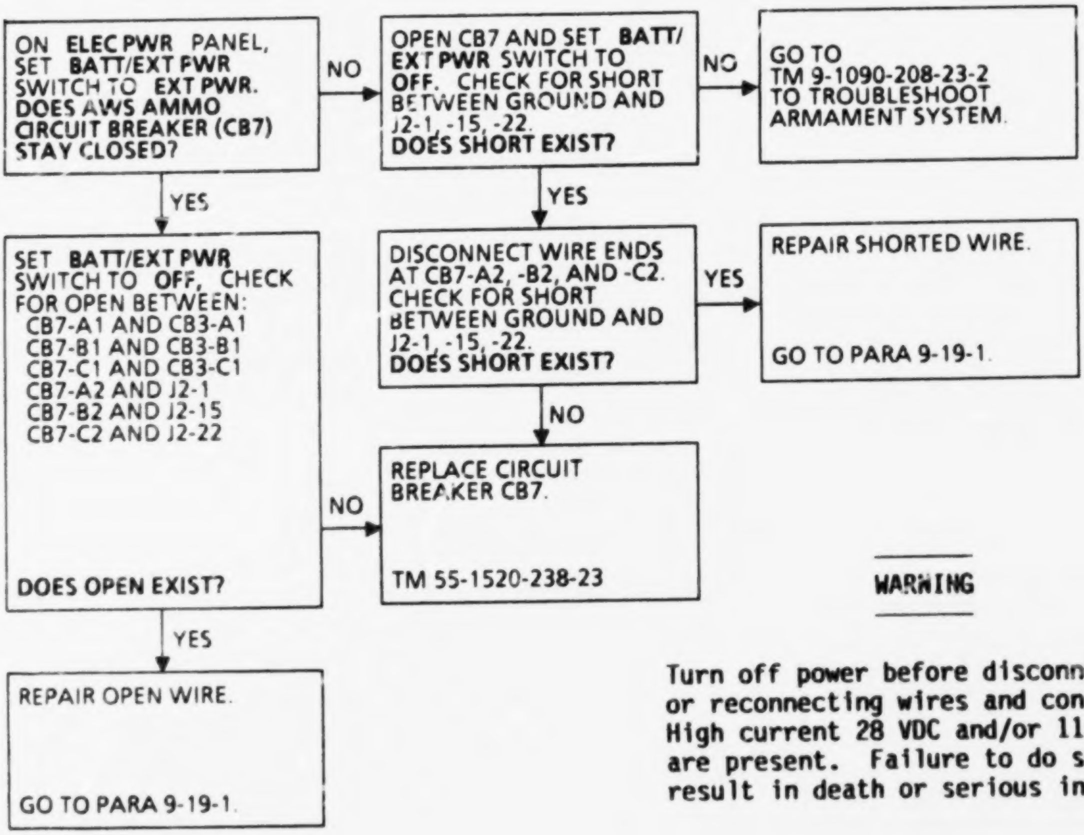
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 9 1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS AMMO CIRCUIT BREAKER (CB7) STAY CLOSED?
NO
OPEN CB7 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND J2-1, -15, -22. DOES SHORT EXIST?
NO
GO TO TM 9-1090-208-23-2 TO TROUBLESHOOT ARMAMENT SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB7-A1 AND CB3-A1 CB7-B1 AND CB3-B1 CB7-C1 AND CB3-C1 CB7-A2 AND J2-1 CB7-B2 AND J2-15 CB7-C2 AND J2-22 DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB7-A2, -B2, AND -C2. CHECK FOR SHORT BETWEEN GROUND AND J2-1, -15, -22. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-19-1.
NO
NO
REPLACE CIRCUIT BREAKER CB7. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-19-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-19-7. FC RC DR CIRCUIT BREAKER (CB8) DOES NOT STAY CLOSED OR CONTINUITY TO VIDEO RECORDER DOES NOT EXIST BETWEEN J4-E AND J2-16

Tools: (para 9-19-6)

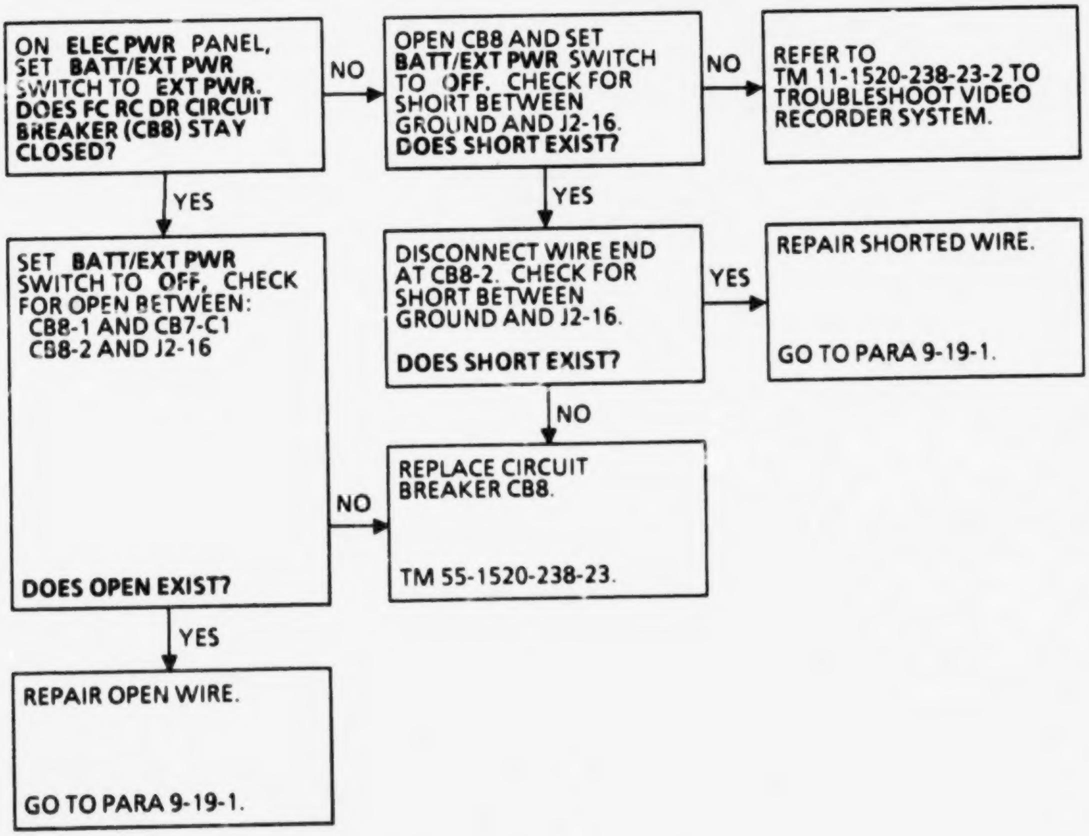
Personnel Required: (para 9-19-6)

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-19-6)

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. DOES FC RC DR CIRCUIT BREAKER (CB8) STAY CLOSED?

OPEN CB8 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND J2-16. DOES SHORT EXIST?

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VIDEO RECORDER SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB8-1 AND CB7-C1
CB8-2 AND J2-16

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB8-2. CHECK FOR SHORT BETWEEN GROUND AND J2-16.

DOES SHORT EXIST?

REPAIR SHORTED WIRE.

GO TO PARA 9-19-1.

REPLACE CIRCUIT BREAKER CB8.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-19-1.

END OF TASK

9-19-8. PRI LT CIRCUIT BREAKER (CB14) DOES NOT STAY CLOSED OR CONTINUITY TO MULTI-CHANNEL DIMMING CONTROLLER DOES NOT EXIST BETWEEN J4-H AND J1-9

Tools: (para 9-19-6)

Personnel Required: (para 9-19-6)

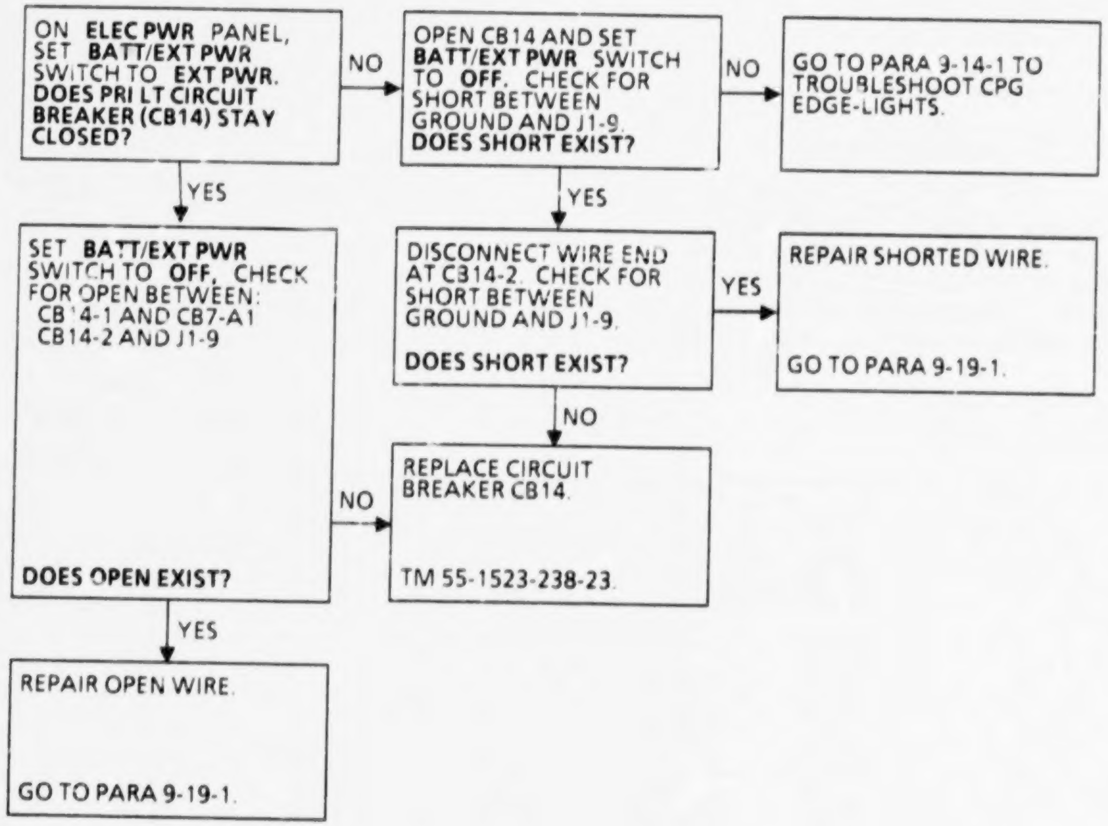
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-19-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES PRI LT CIRCUIT BREAKER (CB14) STAY CLOSED?**
NO
OPEN CB14 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND J1-9. **DOES SHORT EXIST?**
NO
GO TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHTS.
YES
YES
SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN: CB14-1 AND CB7-A1 CB14-2 AND J1-9 **DOES OPEN EXIST?**
DISCONNECT WIRE END AT CB14-2. CHECK FOR SHORT BETWEEN GROUND AND J1-9. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE. GO TO PARA 9-19-1.
NO
NO
REPLACE CIRCUIT BREAKER CB14. TM 55-1523-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-19-1.

END OF TASK

9-20-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

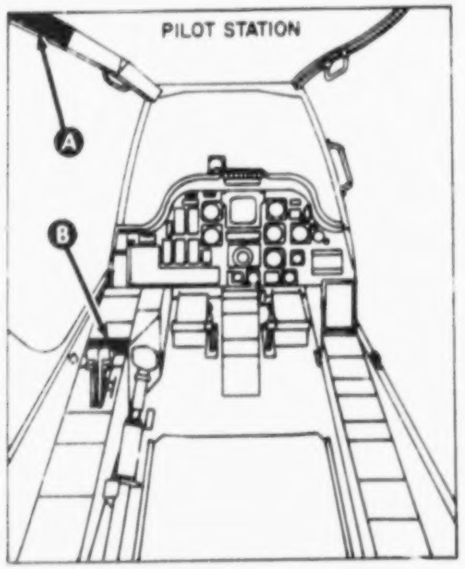
TM 55-1520-238-23

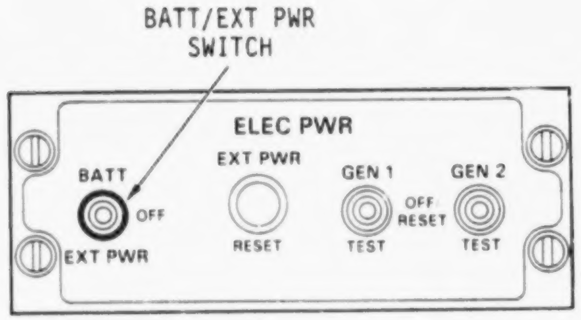
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

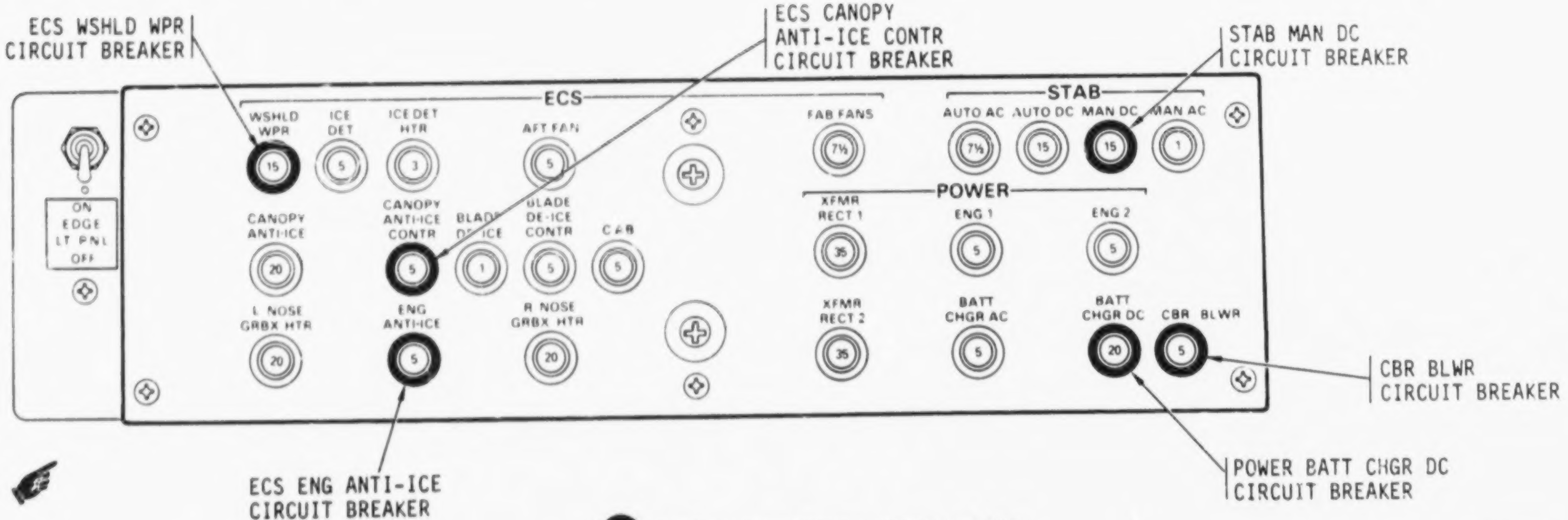
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.





B PILOT ELECT PWR PANEL



A PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1010E

GO TO NEXT PAGE

9-20-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - OPERATIONAL CHECK (cont)

A. On aft circuit breaker panel, disconnect A76P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P4-M and -N.	If short exists, go to para 9-20-4.
2. On ELEC PWR panel, set **BATT/EXT PWR** switch to **EXT PWR.**	
3. Check for 28 VDC at A402J4-M, -N.	If 28 VDC is not present, go to para 9-3-1.
4. On ELEC PWR panel, set **BATT/EXT PWR** switch to **OFF.**	
5. On electrical power distribution box reconnect A76P4.	
6. On pilot circuit breaker panel, check that **STAB MAN DC** (CB6), **ECS CANOPY ANTI ICE CONTR** (CB70), **ECS WSHLD WPR** (CB71), **ECS ENG ANTI ICE** (CB67), **POWER BATT CHGR DC** (CB5) **CBR BLWR** (CB94) circuit breakers are closed.	
7. On ELEC PWR panel, set **BATT/EXT PWR** switch to **EXT PWR.**	
8. Check that circuit breakers closed in step 6 remain closed.	If CB6 does not stay closed, go to para 9-20-5. If CB70 does not stay closed, go to para 9-20-6. If CB71 does not stay closed, go to para 9-20-8. If CB67 does not stay closed, go to para 9-20-9. If CB5 does not stay closed, go to para 9-20-10. If CB94 does not stay closed, go to para 9-20-11.

TASK	RESULT
9. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.	
10. Disconnect A76P1 and A76P2.	
11. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR.	
12. Check for 28 VDC to stabilator relay panel at P2-g.	If 28 VDC is not present, go to para 9-20-5.
13. Check for 28 VDC to anti-ice panel at P1-3.	If 28 VDC is not present, go to para 9-20-6.
14. Check for 28 VDC to windshield wiper motors at P2-b.	If 28 VDC is not present, go to para 9-20-8.
15. Check for 28 VDC to ANTI-ICE panel at P1-4.	If 28 VDC is not present, go to para 9-20-9.
16. Check for 28 VDC to battery charger at P2-a.	If 28 VDC is not present, go to para 9-20-10.
17. Check for 28 VDC to CBR blower at P1-19.	If 28 VDC is not present, go to para 9-20-11.

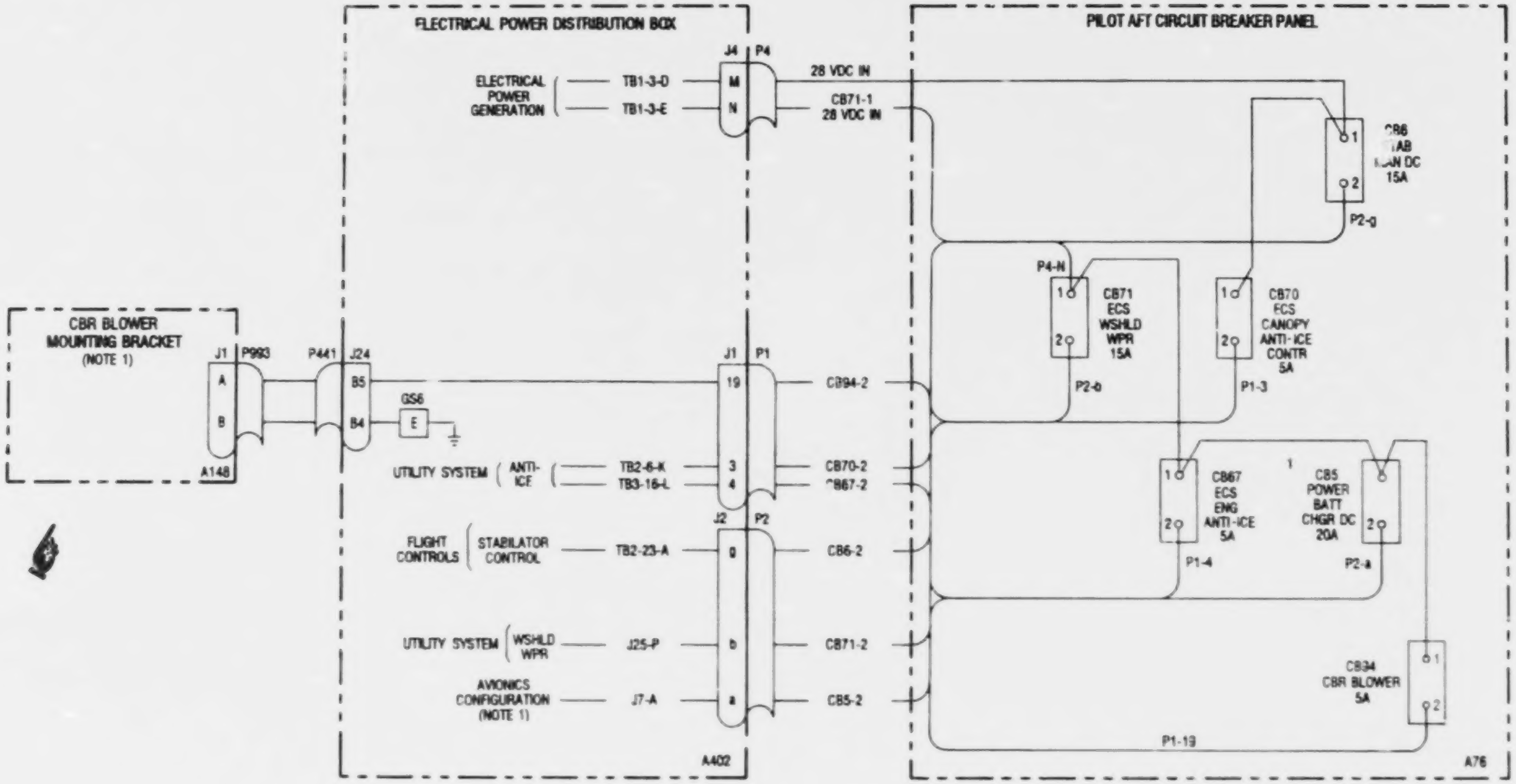
C. On ELEC PWR panel, set BATT/EXT PWR switch to OFF.

D. Reconnect A76P1 and A76P2.

E. Shut down and disconnect GPU from heclicopter (TM 55-1520-238-23).

END OF TASK

9-20-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - INTERCONNECTION DIAGRAM

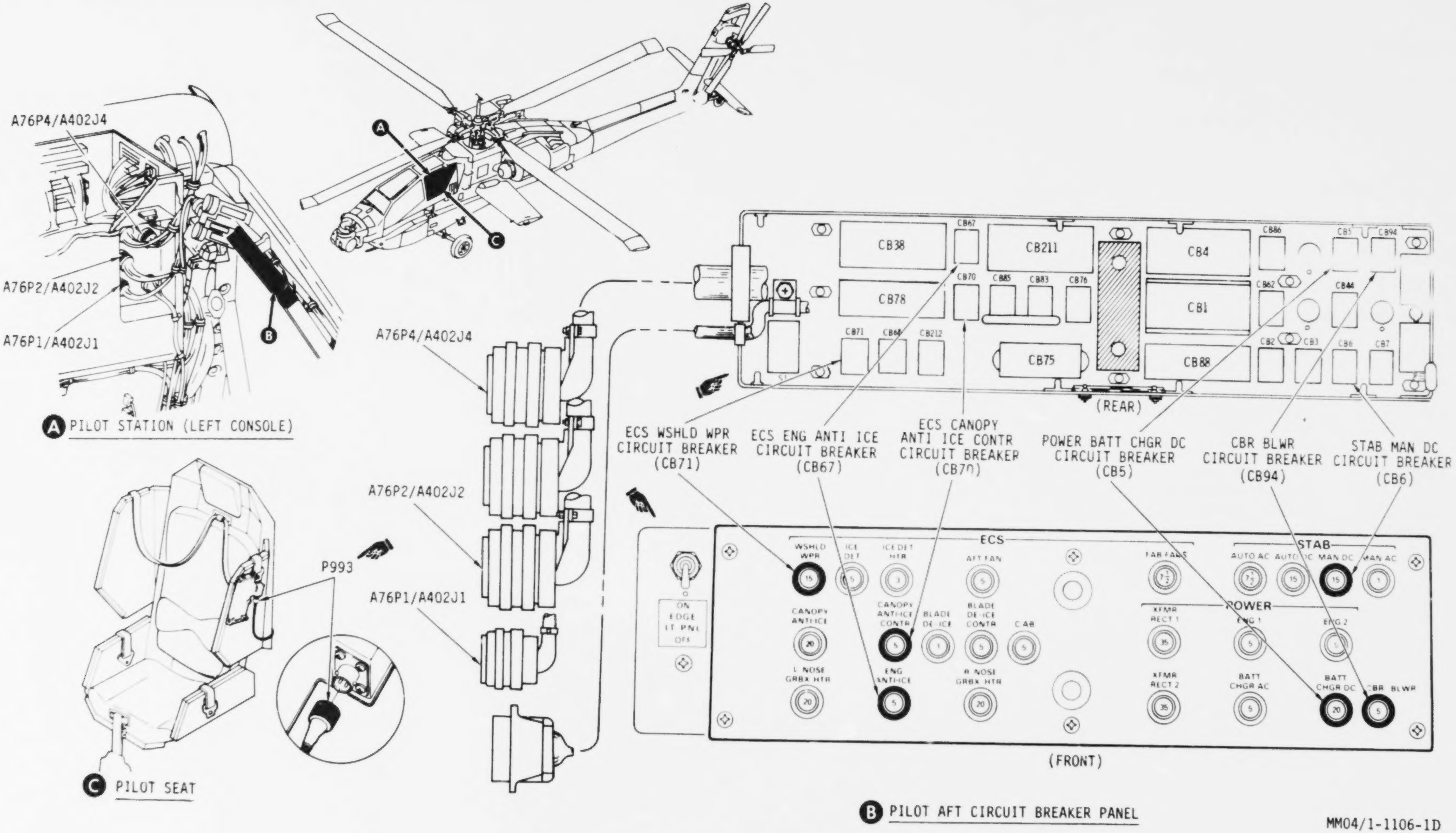


NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-761G

9-20-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



MM04/1-1106-1D

9-20-4. SHORT EXISTS BETWEEN GROUND AND A76P4-M OR -N

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

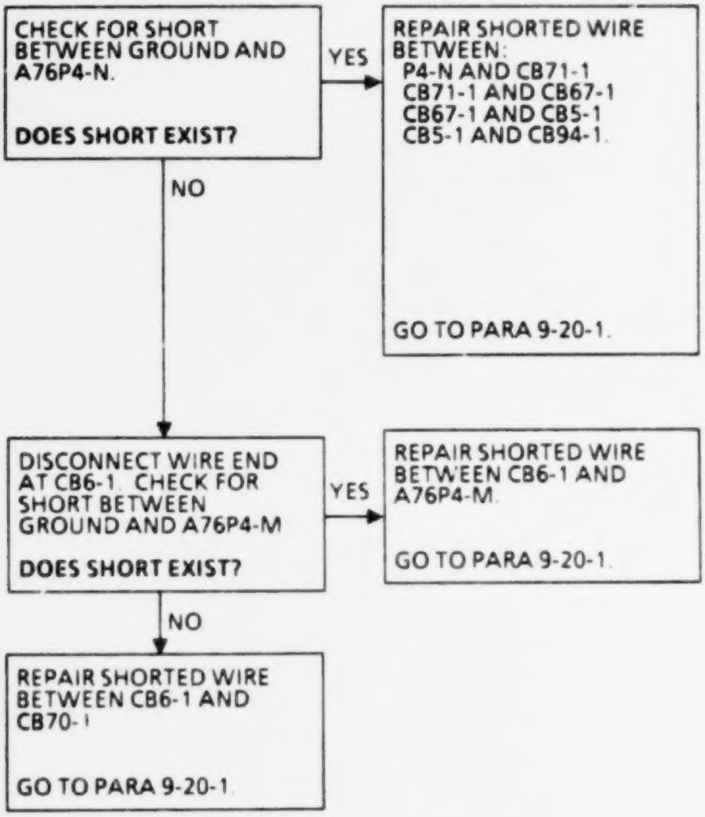
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panels accessing completed
Para 9-20-1	All DC essential bus 1 pilot station circuit breakers open


CHECK FOR SHORT BETWEEN GROUND AND A76P4-N.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN:
P4-N AND CB71-1
CB71-1 AND CB67-1
CB67-1 AND CB5-1
CB5-1 AND CB94-1.
GO TO PARA 9-20-1.
NO
DISCONNECT WIRE END AT CB6-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-M
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB6-1 AND A76P4-M.
GO TO PARA 9-20-1.
NO
REPAIR SHORTED WIRE BETWEEN CB6-1 AND CB70-1
GO TO PARA 9-20-1.

END OF TASK

9-20-5. STAB MAN DC CIRCUIT BREAKER (CB6) - DOES NOT STAY CLOSED OR 28 VDC TO STABILATOR RELAY PANEL IS NOT PRESENT AT A76P2-g

Tools: (para 9-20-4)

Personnel Required: (para 9-20-4)

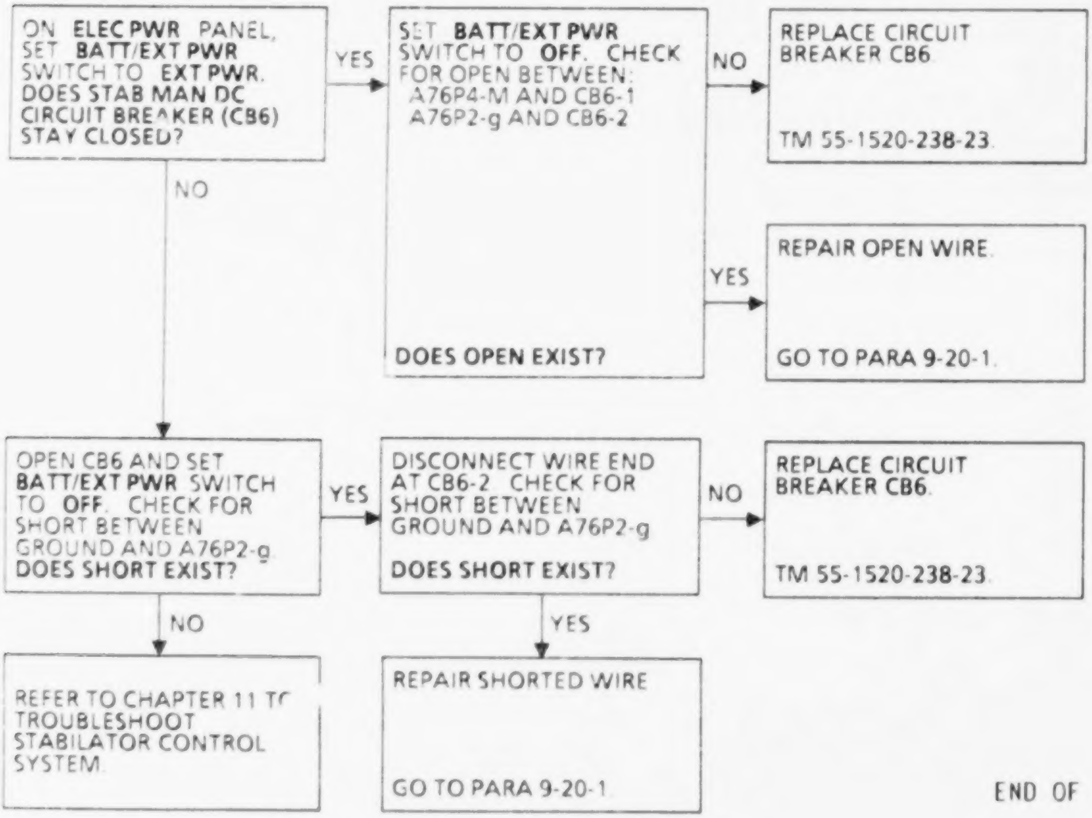
References: (para 9-20-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB MAN DC CIRCUIT BREAKER (CB6) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: A76P4-M AND CB6-1 A76P2-g AND CB6-2
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB6.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-20-1.
NO
OPEN CB6 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P2-g. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB6-2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-g
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB6.
TM 55-1520-238-23.
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.
YES
REPAIR SHORTED WIRE
GO TO PARA 9-20-1.

END OF TASK

9-20-6. ECS CANOPY ANTI ICE CONTR CIRCUIT BREAKER (CB70) - DOES NOT STAY CLOSED OR 28 VDC TO ANTI ICE PANEL IS NOT PRESENT AT A76P1-3

9-20-5/9-20-6

Tools: (para 9-20-4)

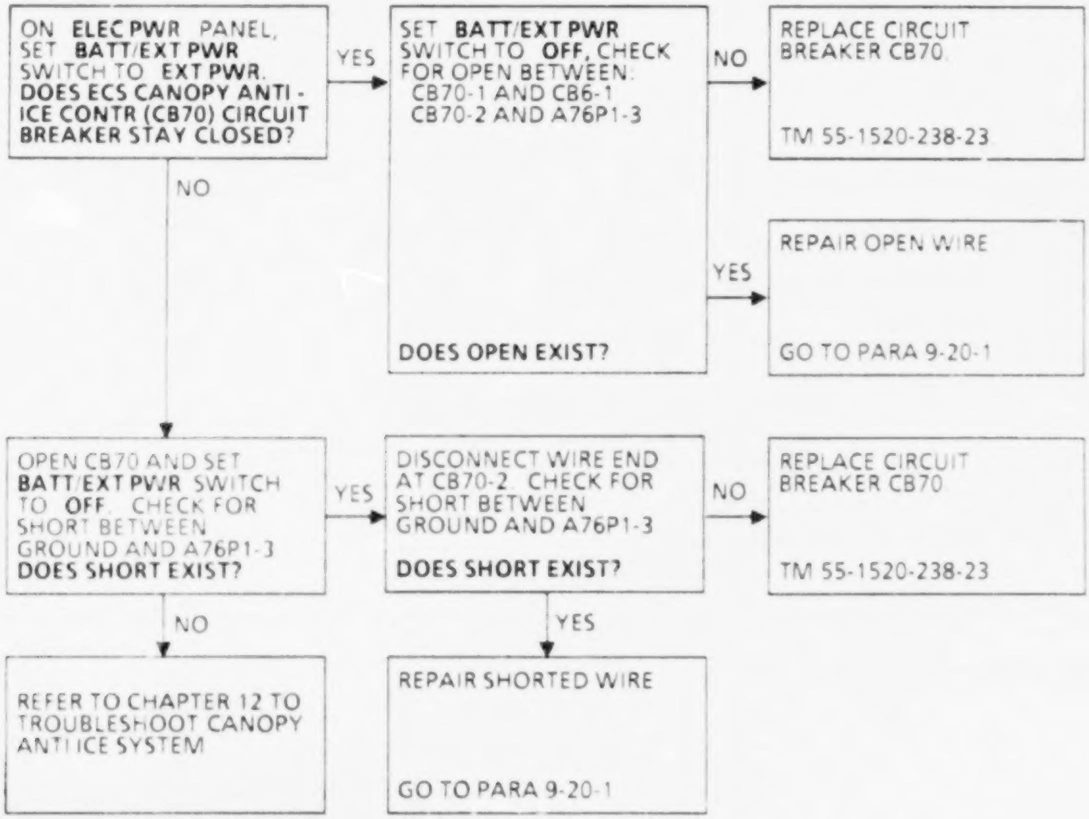
Personnel Required: (para 9-20-4)

References: (para 9-20-4)

Equipment Conditions: (para 9-20-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES ECS CANOPY ANTI - ICE CONTR (CB70) CIRCUIT BREAKER STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB70-1 AND CB6-1
CB70-2 AND A76P1-3
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB70.
TM 55-1520-238-23

REPAIR OPEN WIRE
GO TO PARA 9-20-1

OPEN CB70 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-3
DOES SHORT EXIST?

DISCONNECT WIRE END AT CB70-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-3
DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB70.
TM 55-1520-238-23

REFER TO CHAPTER 12 TO TROUBLESHOOT CANOPY ANTI ICE SYSTEM

REPAIR SHORTED WIRE
GO TO PARA 9-20-1

END OF TASK

9-20-8. ECS WSHLD WPR CIRCUIT BREAKER (CB71) - DOES NOT STAY CLOSED OR 28 VDC TO WINDSHIELD WIPER MOTORS IS NOT PRESENT AT A76P2-b

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

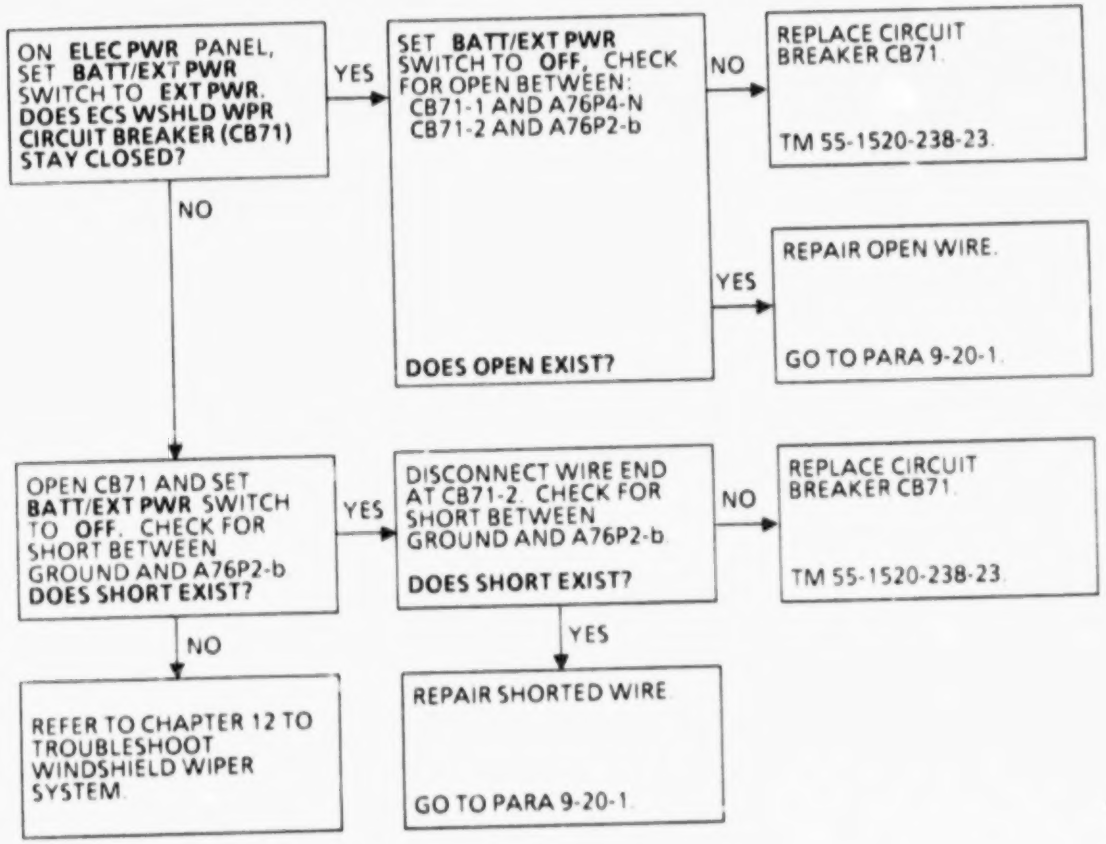
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical
Para 9-15-2	Pilot circuit breaker panel accessing completed

Para 9-20-7 deleted.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS WSHLD WPR CIRCUIT BREAKER (CB71) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB71-1 AND A76P4-N CB71-2 AND A76P2-b DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB71. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-20-1.
NO
OPEN CB71 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P2-b DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB71-2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-b DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB71. TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE. GO TO PARA 9-20-1.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT WINDSHIELD WIPER SYSTEM.

9-20-9. ECS ENG ANTI ICE CIRCUIT BREAKER (CB67) - DOES NOT STAY CLOSED OR 29 VDC TO ANTI ICE PANEL IS NOT PRESENT AT A76P1-4

Tools: (para 9-20-8)

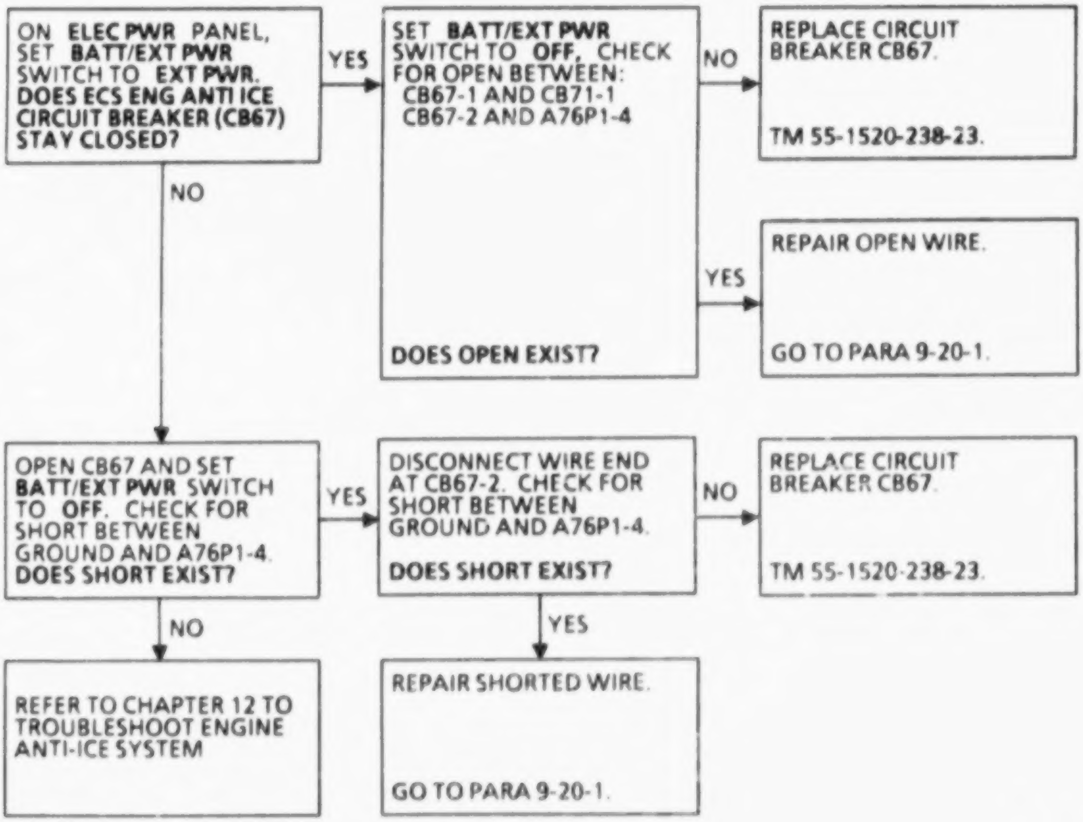
Personnel Required: (para 9-20-8)

References: (para 9-20-8)

Equipment Conditions: (para 9-20-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS ENG ANTI ICE CIRCUIT BREAKER (CB67) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB67-1 AND CB71-1 CB67-2 AND A76P1-4
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB67.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-20-1.
NO
OPEN CB67 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P1-4. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB67-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-4.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB67.
TM 55-1520-238-23.
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ENGINE ANTI-ICE SYSTEM
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-20-1.

END OF TASK

9-20-10. POWER BATT CHGR DC CIRCUIT BREAKER (CB5) - DOES NOT STAY CLOSED OR 28 VDC TO BATTERY CHARGER IS NOT PRESENT AT A76P2-a

Tools: (para 9-20-8)

Personnel Required: (para 9-20-8)

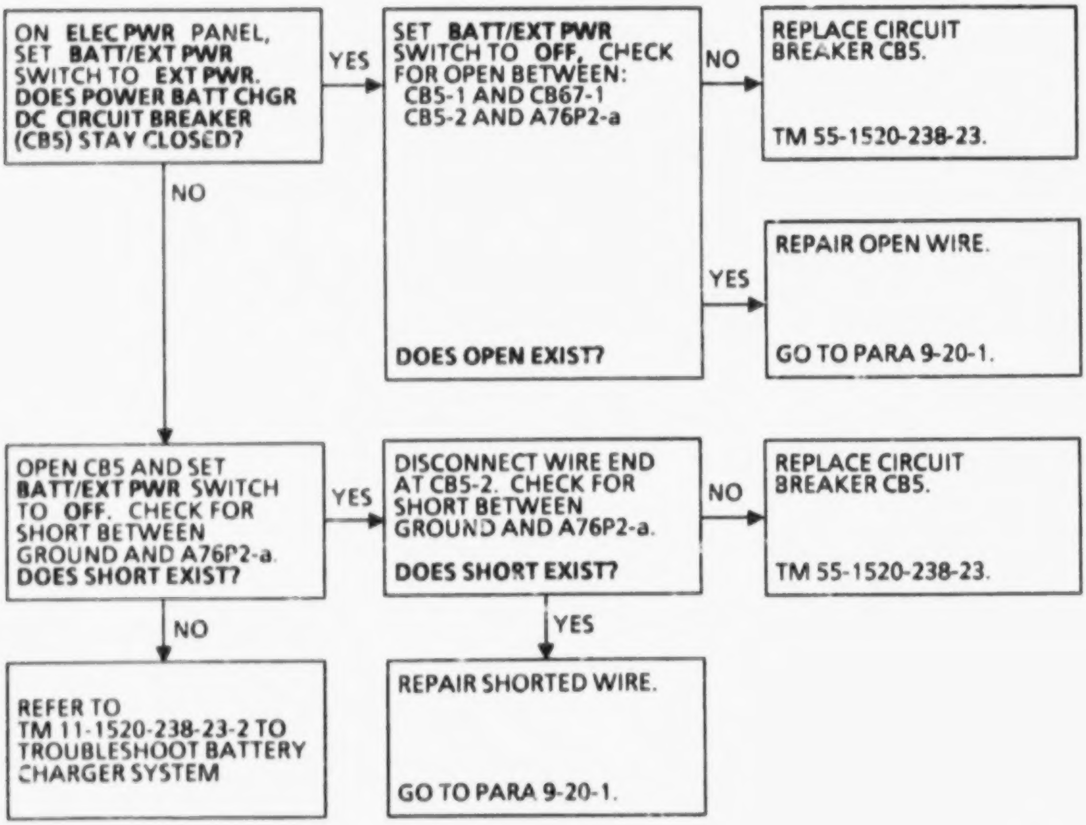
References:

TM 11-1520-238-23-2
TM 55-1520-238-23

Equipment Conditions: (para 9-20-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES POWER BATT CHGR DC CIRCUIT BREAKER (CB5) STAY CLOSED?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB5-1 AND CB67-1 CB5-2 AND A76P2-a
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB5.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-20-1.
NO
OPEN CB5 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76P2-a. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB5-2. CHECK FOR SHORT BETWEEN GROUND AND A76P2-a.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB5.
TM 55-1520-238-23.
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT BATTERY CHARGER SYSTEM
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-20-1.

END OF TASK

9-20-11. PILOT CBR BLWR CIRCUIT BREAKER (CB94) - DOES NOT STAY CLOSED, OR 28 VDC IS NOT PRESENT BETWEEN P993-A AND P993-B

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

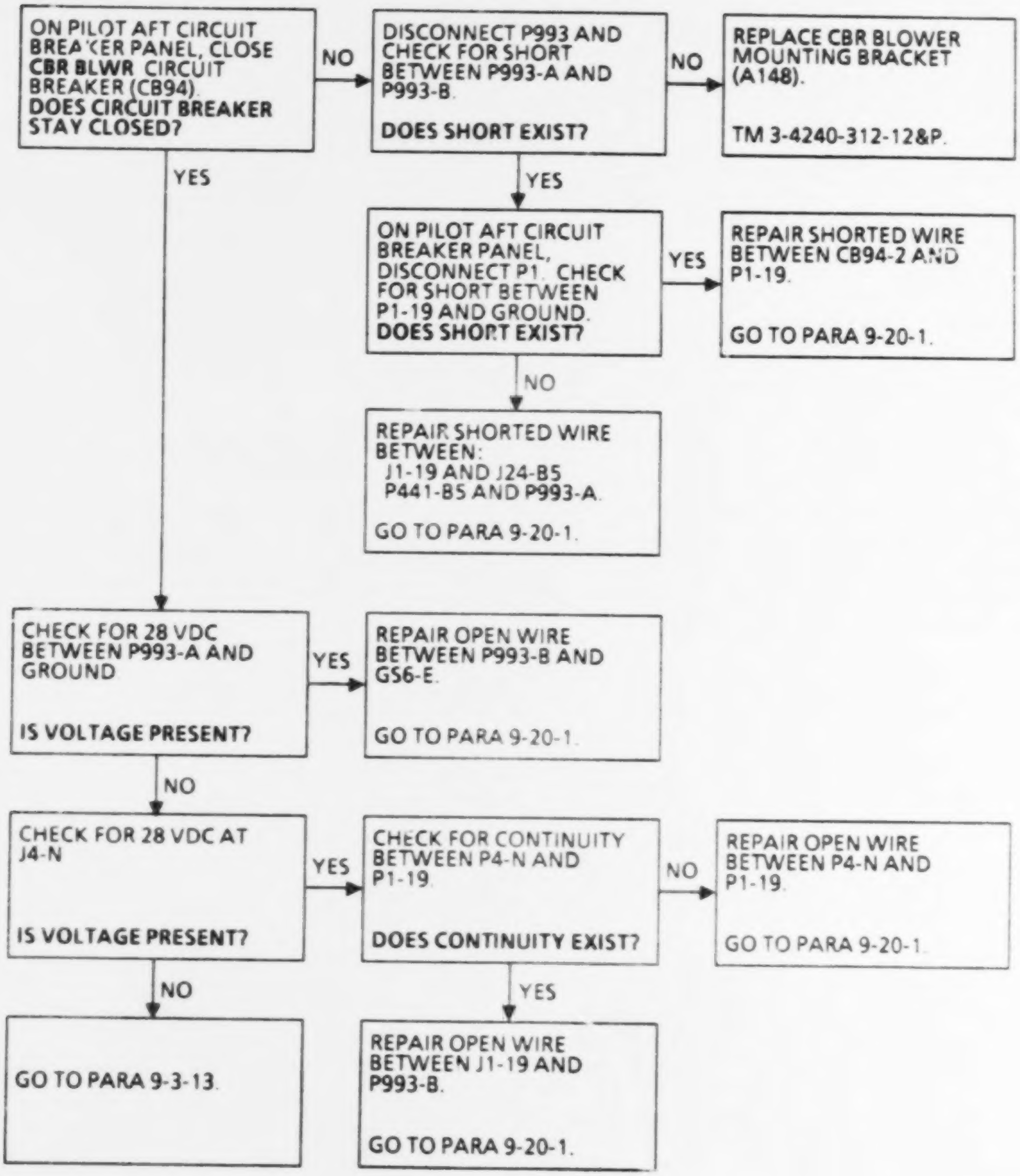
TM 55-1520-238-23
TM 3-4240-312-12&P

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT AFT CIRCUIT BREAKER PANEL, CLOSE **CBR BLWR** CIRCUIT BREAKER (CB94). **DOES CIRCUIT BREAKER STAY CLOSED?**
NO
DISCONNECT P993 AND CHECK FOR SHORT BETWEEN P993-A AND P993-B. **DOES SHORT EXIST?**
NO
REPLACE CBR BLOWER MOUNTING BRACKET (A148). TM 3-4240-312-12&P.
YES
YES
ON PILOT AFT CIRCUIT BREAKER PANEL, DISCONNECT P1. CHECK FOR SHORT BETWEEN P1-19 AND GROUND. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE BETWEEN CB94-2 AND P1-19. GO TO PARA 9-20-1.
NO
REPAIR SHORTED WIRE BETWEEN: J1-19 AND J24-B5 P441-B5 AND P993-A. GO TO PARA 9-20-1.
CHECK FOR 28 VDC BETWEEN P993-A AND GROUND **IS VOLTAGE PRESENT?**
YES
REPAIR OPEN WIRE BETWEEN P993-B AND GS6-E. GO TO PARA 9-20-1.
NO
CHECK FOR 28 VDC AT J4-N **IS VOLTAGE PRESENT?**
YES
CHECK FOR CONTINUITY BETWEEN P4-N AND P1-19. **DOES CONTINUITY EXIST?**
NO
REPAIR OPEN WIRE BETWEEN P4-N AND P1-19. GO TO PARA 9-20-1.
NO
GO TO PARA 9-3-13.
YES
REPAIR OPEN WIRE BETWEEN J1-19 AND P993-B. GO TO PARA 9-20-1.

END OF TASK

9-21-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician
	One person to assist

References:

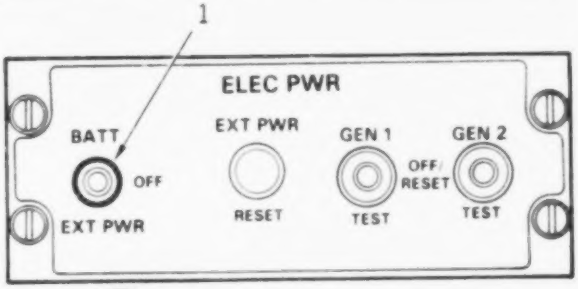
TM 55-1520-238-23

Equipment Conditions:

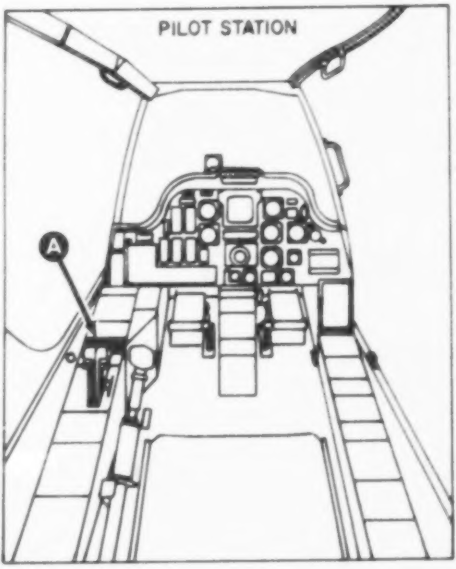
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

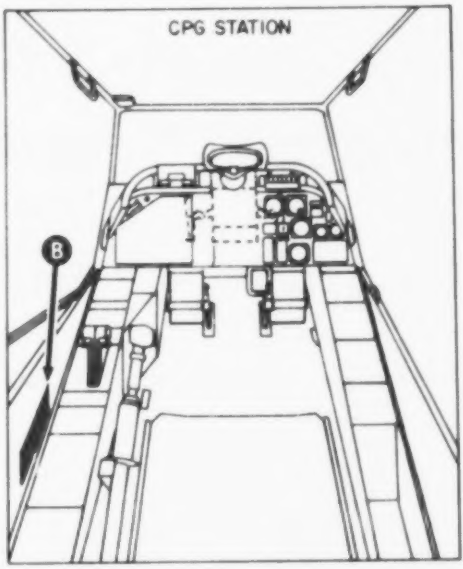
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



A PILOT ELECT PWR PANEL





A. Disconnect P763.

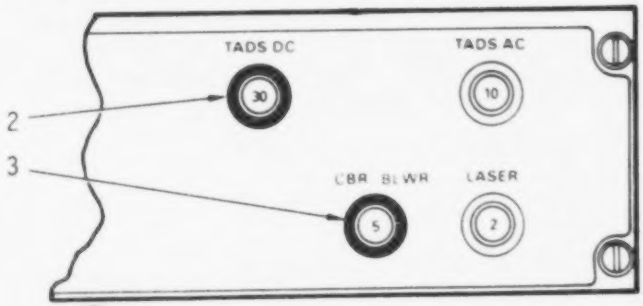
B. Complete operational check as follows:

TASK	RESULT
1. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
2. Check for 28 VDC at P763-D.	If 28 VDC is not present, go to para 9-21-4.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect P763.	
4. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
5. On CPG circuit breaker panel no. 2, check that **TADS DC** (CB2) (2) and **CBR BLWR** (CB5) (3) circuit breakers are closed.	If CB2 (2) does not stay closed, go to para 9-21-5. If CB5 (3) does not stay closed, go to para 9-21-6.
6. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect P761 and P997.	
7. With **BATT/EXT PWR** switch (1) set to **EXT PWR**, check for 28 VDC to TADS/PNVS turret at J1-C, -G, -L, -M.	If 28 VDC is not present, go to para 9-21-5.
8. Check for 28 VDC to CBR blower between P997-A and -B.	If 28 VDC is not present, go to para 9-21-6.

C. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.

D. Reconnect P761 and P997.

E. Remove external power - Electrical (TM 55-1520-238-23).

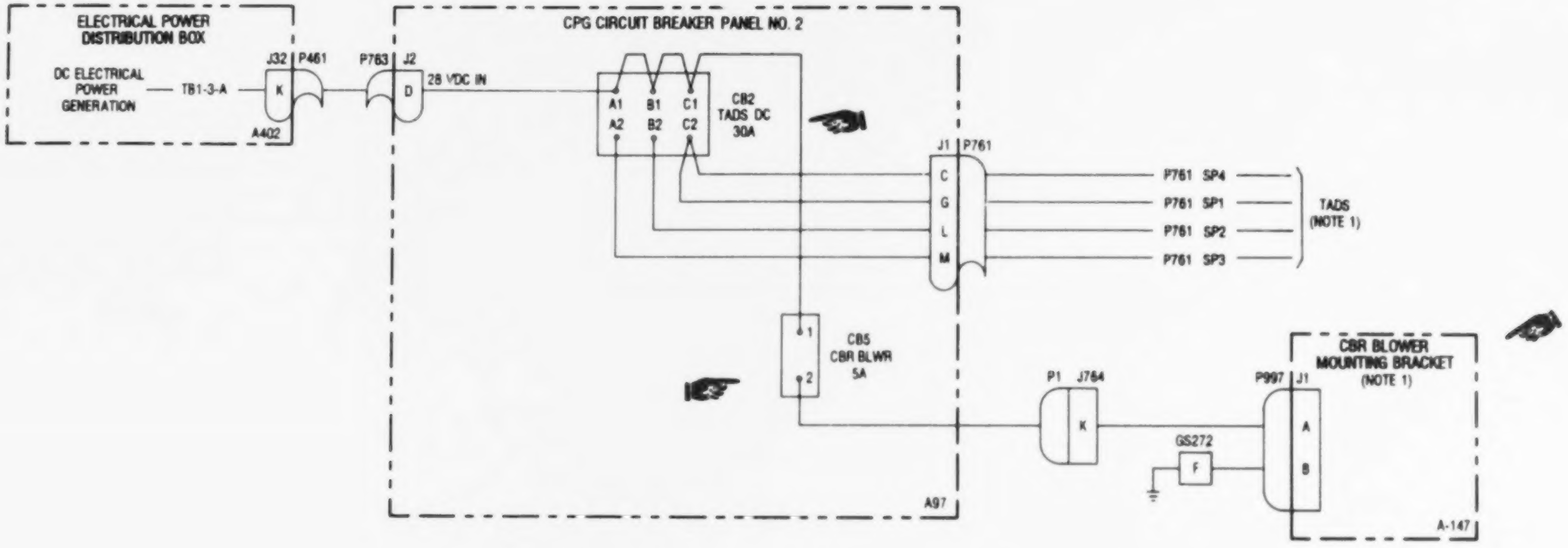


B CPG CIRCUIT BREAKER PANEL NO.2

MM04/1-1011C

END OF TASK

9-21-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - CPG STATION) - INTERCONNECT DIAGRAM

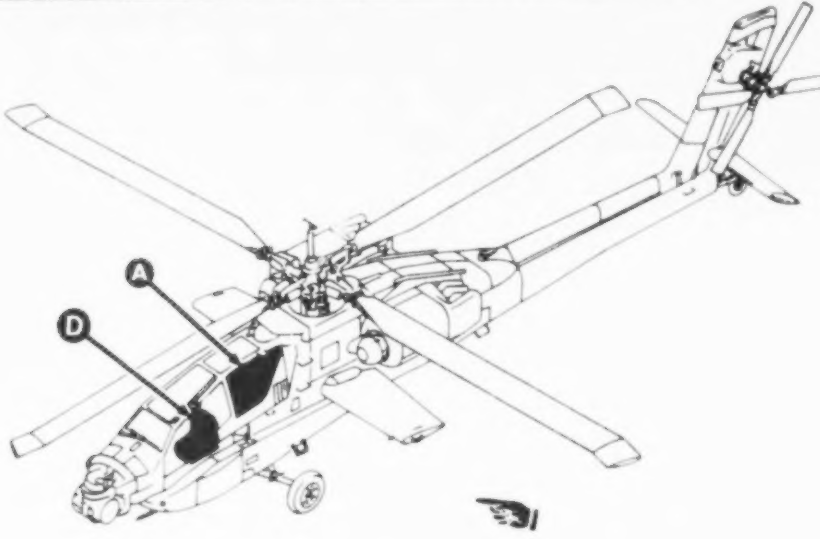


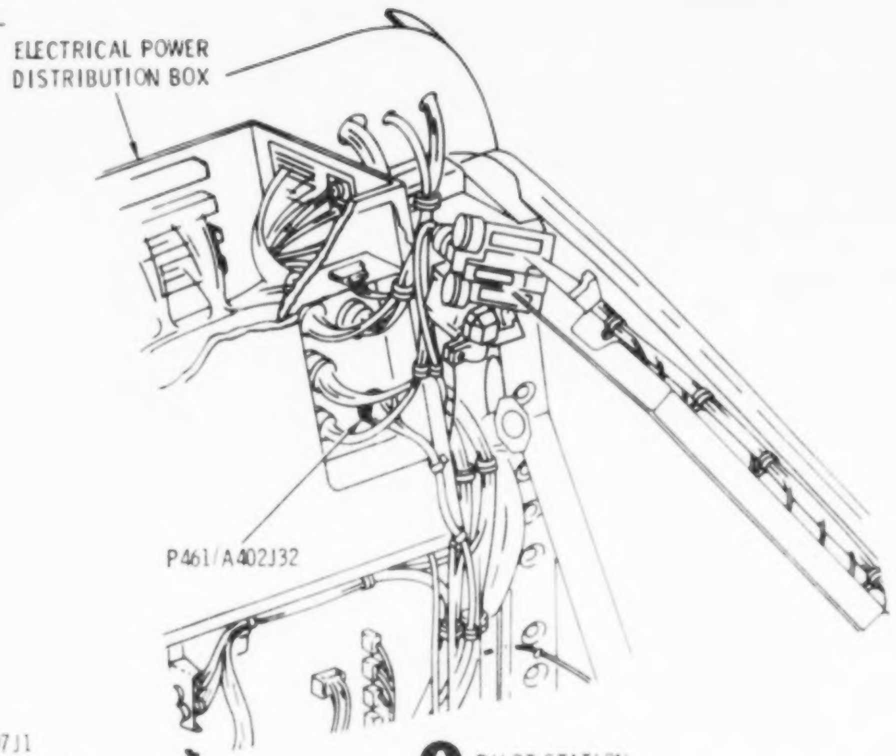
NOTE:

1 REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

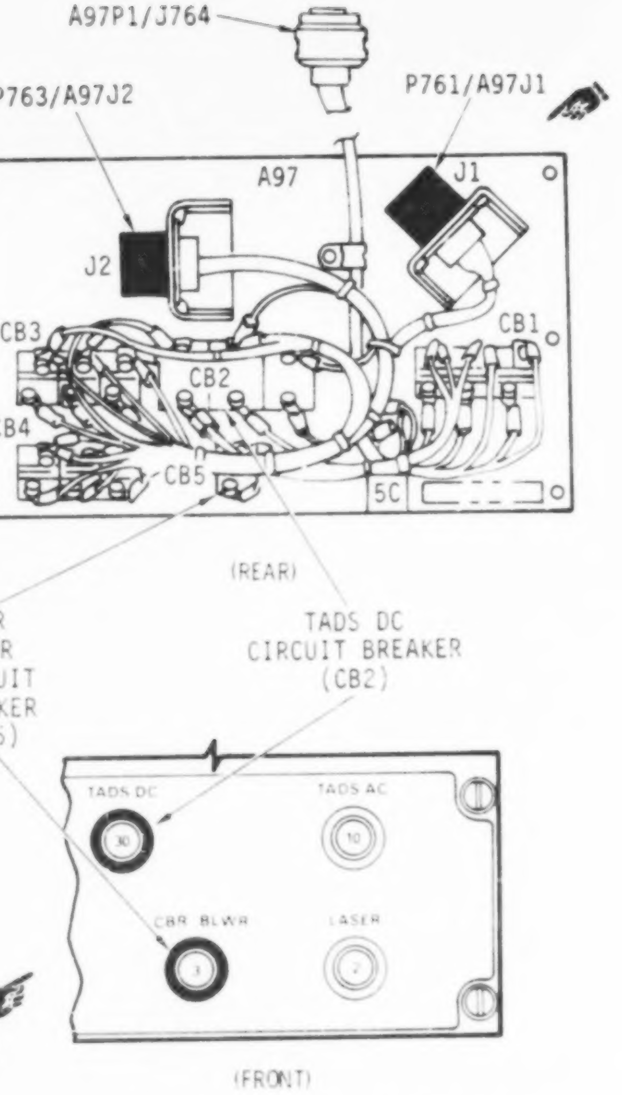
MM04/1-762B

9-21-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 1 - CPG STATION) ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

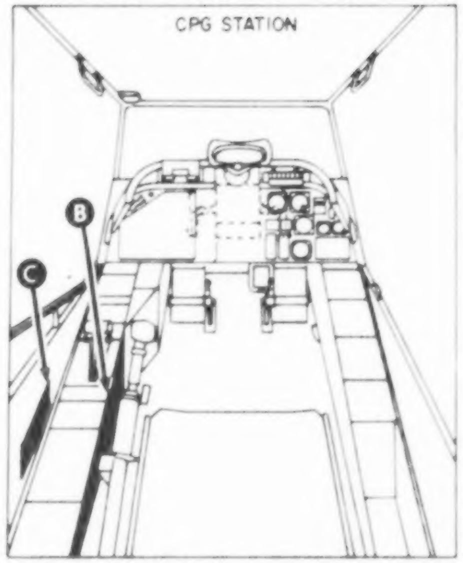


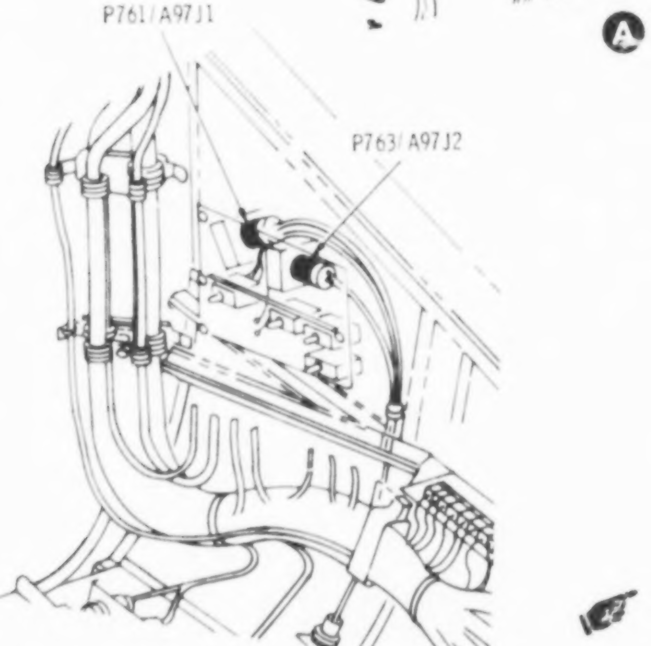


A PILOT STATION

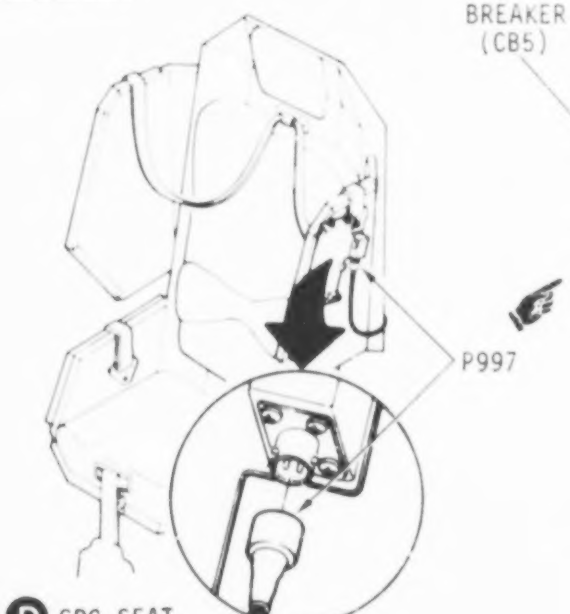


C CPG CIRCUIT BREAKER PANEL NO. 2





B CPG STATION (BELOW LEFT CONSOLE)



D CPG SEAT

MM04/1-1111E

END OF TASK

9-21-4. 28 VDC IS NOT PRESENT AT P763-D

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

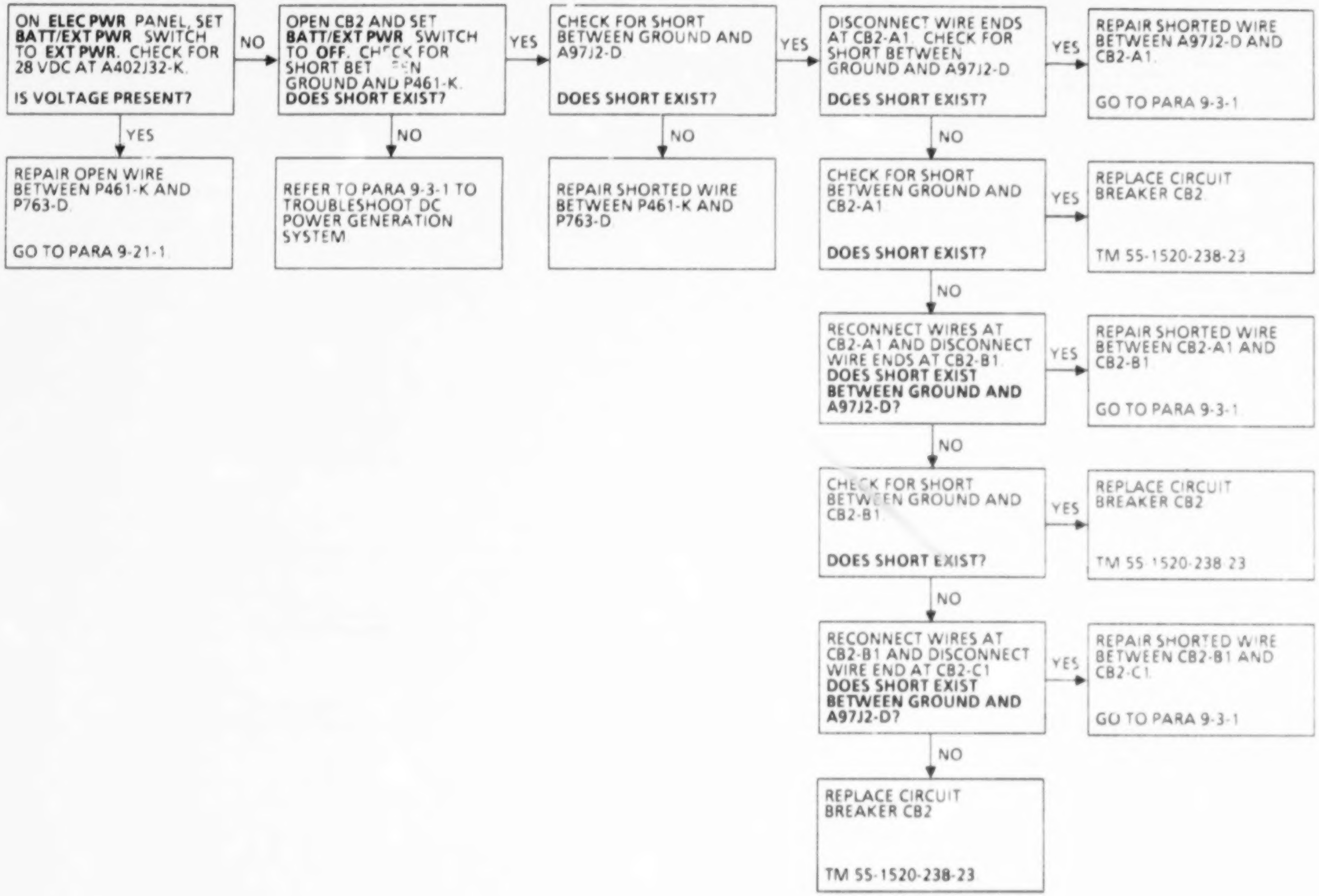
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-21-1	Open TADS DC circuit breaker

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. CHECK FOR 28 VDC AT A402J32-K. **IS VOLTAGE PRESENT?**

OPEN CB2 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P461-K. **DOES SHORT EXIST?**

CHECK FOR SHORT BETWEEN GROUND AND A97J2-D. **DOES SHORT EXIST?**

DISCONNECT WIRE ENDS AT CB2-A1. CHECK FOR SHORT BETWEEN GROUND AND A97J2-D. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE BETWEEN A97J2-D AND CB2-A1. GO TO PARA 9-3-1

REPAIR OPEN WIRE BETWEEN P461-K AND P763-D. GO TO PARA 9-21-1

REFER TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM

REPAIR SHORTED WIRE BETWEEN P461-K AND P763-D

CHECK FOR SHORT BETWEEN GROUND AND CB2-A1. **DOES SHORT EXIST?**

REPLACE CIRCUIT BREAKER CB2. TM 55-1520-238-23

RECONNECT WIRES AT CB2-A1 AND DISCONNECT WIRE ENDS AT CB2-B1. **DOES SHORT EXIST BETWEEN GROUND AND A97J2-D?**

REPAIR SHORTED WIRE BETWEEN CB2-A1 AND CB2-B1. GO TO PARA 9-3-1

CHECK FOR SHORT BETWEEN GROUND AND CB2-B1. **DOES SHORT EXIST?**

REPLACE CIRCUIT BREAKER CB2. TM 55-1520-238-23

RECONNECT WIRES AT CB2-B1 AND DISCONNECT WIRE END AT CB2-C1. **DOES SHORT EXIST BETWEEN GROUND AND A97J2-D?**

REPAIR SHORTED WIRE BETWEEN CB2-B1 AND CB2-C1. GO TO PARA 9-3-1

REPLACE CIRCUIT BREAKER CB2. TM 55-1520-238-23

END OF TASK

9-21-5. TADS DC CIRCUIT BREAKER (CB2) - DOES NOT STAY CLOSED OR 28 VDC TO TADS/PNVS TURRET IS NOT PRESENT AT A97J1-M, -L, -G, -C

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

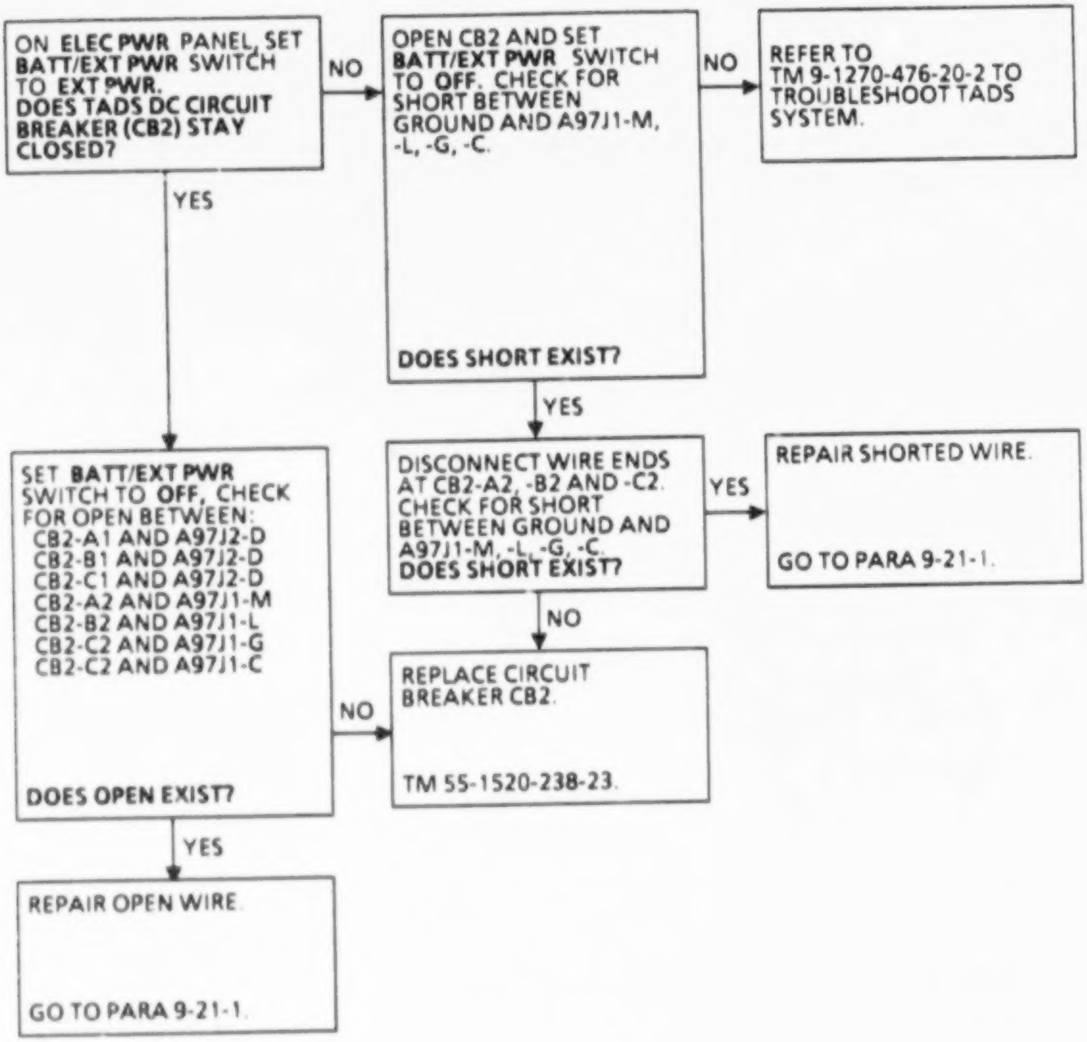
TM 55-1520-238-23
TM 9-1270-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.**
DOES TADS DC CIRCUIT BREAKER (CB2) STAY CLOSED?

OPEN CB2 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A97J1-M, -L, -G, -C.
DOES SHORT EXIST?

REFER TO TM 9-1270-476-20-2 TO TROUBLESHOOT TADS SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN:
CB2-A1 AND A97J2-D
CB2-B1 AND A97J2-D
CB2-C1 AND A97J2-D
CB2-A2 AND A97J1-M
CB2-B2 AND A97J1-L
CB2-C2 AND A97J1-G
CB2-C2 AND A97J1-C
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB2-A2, -B2 AND -C2. CHECK FOR SHORT BETWEEN GROUND AND A97J1-M, -L, -G, -C.
DOES SHORT EXIST?

REPAIR SHORTED WIRE.
GO TO PARA 9-21-1.

REPLACE CIRCUIT BREAKER CB2.
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-21-1.

END OF TASK

9-21-6. CPG CBR BLWR CIRCUIT BREAKER (CB5) - DOES NOT STAY CLOSED OR 28 VDC IS NOT PRESENT BETWEEN P997-A AND P997-B

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

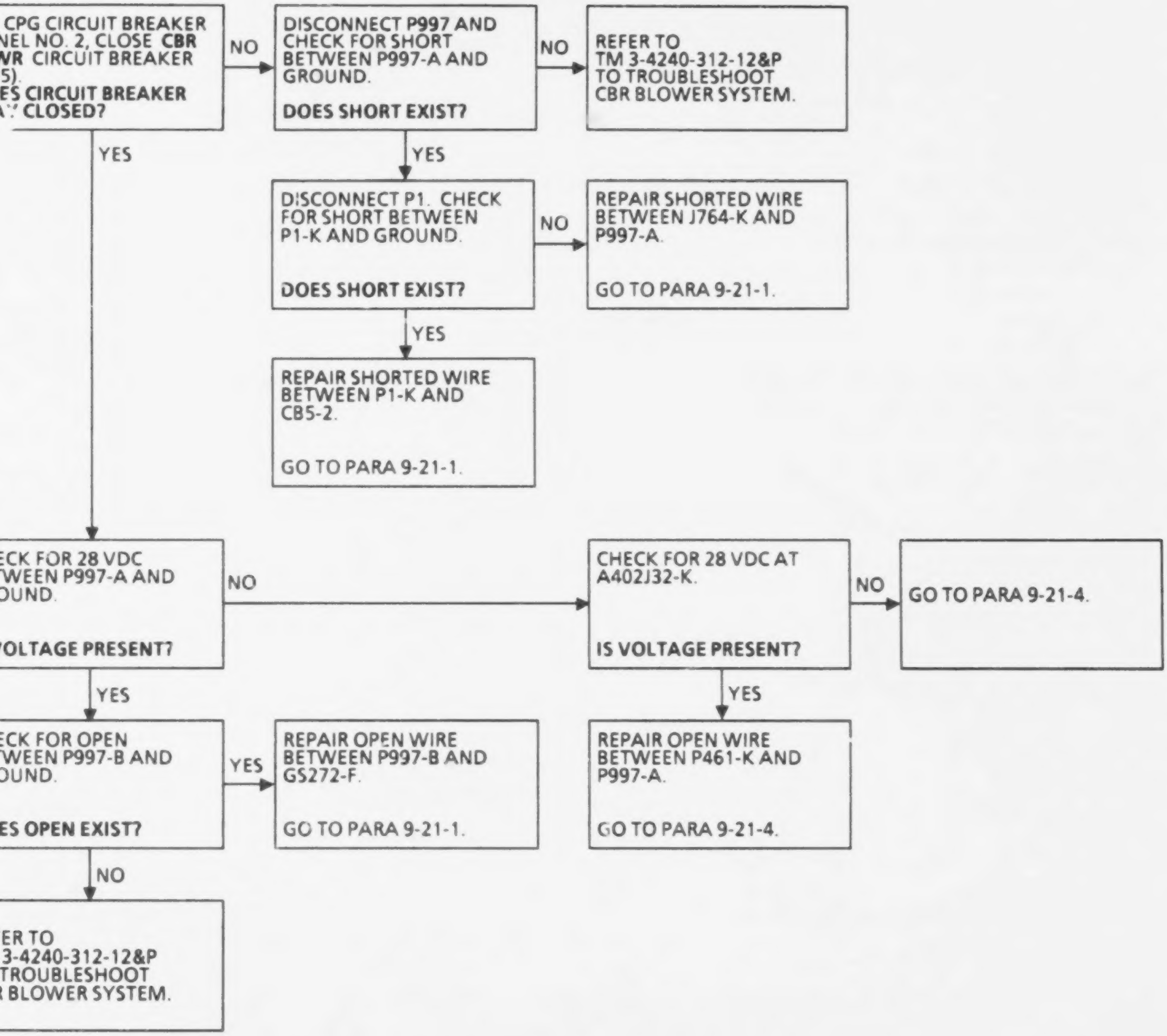
TM 55-1520-238-23
TM 3-4240-312-12&P

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CPG CIRCUIT BREAKER NEL NO. 2, CLOSE CBR VR CIRCUIT BREAKER 5). ES CIRCUIT BREAKER A' CLOSED?
NO
DISCONNECT P997 AND CHECK FOR SHORT BETWEEN P997-A AND GROUND. DOES SHORT EXIST?
NO
REFER TO TM 3-4240-312-12&P TO TROUBLESHOOT CBR BLOWER SYSTEM.
YES
YES
DISCONNECT P1. CHECK FOR SHORT BETWEEN P1-K AND GROUND. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN J764-K AND P997-A. GO TO PARA 9-21-1.
YES
REPAIR SHORTED WIRE BETWEEN P1-K AND CB5-2. GO TO PARA 9-21-1.
ECK FOR 28 VDC TWEEN P997-A AND OUND. VOLTAGE PRESENT?
NO
CHECK FOR 28 VDC AT A402J32-K. IS VOLTAGE PRESENT?
NO
GO TO PARA 9-21-4.
YES
YES
ECK FOR OPEN TWEEN P997-B AND OUND. ES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN P997-B AND GS272-F. GO TO PARA 9-21-1.
REPAIR OPEN WIRE BETWEEN P461-K AND P997-A. GO TO PARA 9-21-4.
NO
ER TO 3-4240-312-12&P TROUBLESHOOT R BLOWER SYSTEM.

END OF TASK

9-22-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

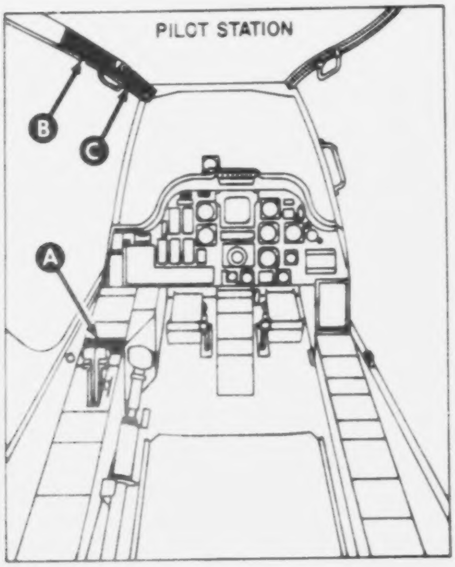
TM 55-1520-238-23

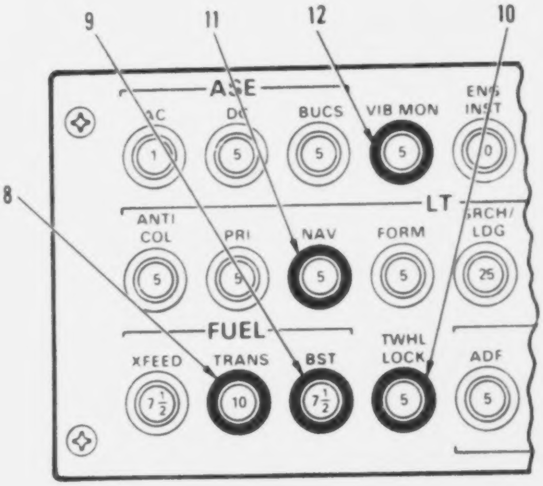
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical
Para 1-3-2	ICS connected

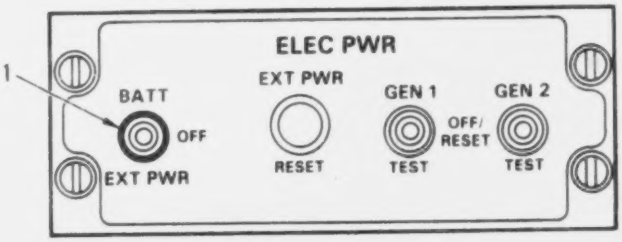
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.





B PILOT CENTER CIRCUIT BREAKER PANEL

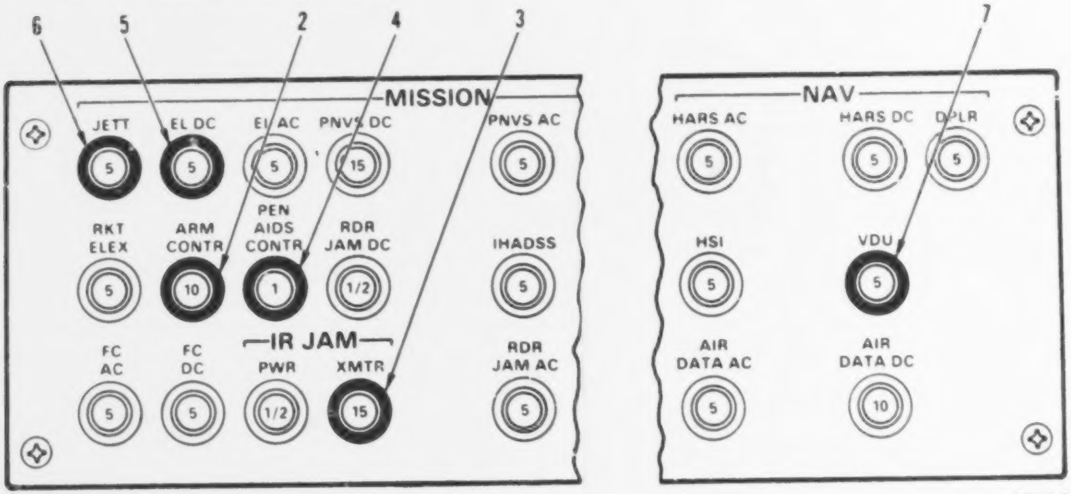


A PILOT ELEC PWR PANEL

A. Disconnect A76P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P4-J and -G.	If short circuit condition exists, go to para 9-22-4.
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
3. Check for 28 VDC at A402J4-J and -G.	If 28 VDC is not present, go to para 9-3-1.
4. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect A76P4.	
5. On pilot circuit breaker panel check that the: **MISSION ARM CONTR** (CB46) (2), **IR JAM XMTR** (CB66) (3), **MISSION PEN AIDS CONTR** (CB49) (4), **MISSION EL DC** (CB93) (5), **MISSION JETT** (CB89) (6), **NAV VDU** (CB91) (7), **FUEL TRANS** (CB56) (8), **FUEL BST** (CB57) (9), **TWHL LOCK** (CB59) (10), **LT NAV** (CB73) (11), and **VIB MON** (CB79) (12) circuit breakers are closed.	



MM04/1-1012B

Ⓒ PILOT FORWARD CIRCUIT BREAKER PANEL

GO TO NEXT PAGE

9-22-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
6. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
7. Check that circuit breakers in step 5 remain closed.	If CB46 (2) does not stay closed, go to para 9-22-5.
	If CB66 (3) does not stay closed, go to para 9-22-6.
	If CB49 (4) does not stay closed, go to para 9-22-7.
	If CB93 (5) does not stay closed, go to para 9-22-8.
	If CB89 (6) does not stay closed, go to para 9-22-9.
	If CB91 (7) does not stay closed, go to para 9-22-10.
	If CB56 (8) does not stay closed, go to para 9-22-11.
	If CB57 (9) does not stay closed, go to para 9-22-12.
	If CB59 (10) does not stay closed, go to para 9-22-13.
	If CB73 (11) does not stay closed, go to para 9-22-14.
	If CB79 (12) does not stay closed, go to para 9-22-15.
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect A76P1 and P2.	
9. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	

TASK	RESULT
10. Check for 28 VDC to ground maintenance switch at P2-E.	If 28 VDC is not present, go to para 9-22-5.
11. Check for 28 VDC to IR jammer at P2-h.	If 28 VDC is not present, go to para 9-22-6.
12. Check for 28 VDC to pilot **FUEL** panel at P2-D.	If 28 VDC is not present, go to para 9-22-11.
13. Check for 28 VDC to radar and IR jammer controls at P1-49.	If 28 VDC is not present, go to para 9-22-7.
14. Check for 28 VDC to external stores elevation panel at P1-29.	If 28 VDC is not present, go to para 9-22-8.
15. Check for 28 VDC to stores jettison panel at P1-18.	If 28 VDC is not present, go to para 9-22-9.
16. Check for 28 VDC to video display unit at P1-41 and P1-42.	If 28 VDC is not present, go to para 9-22-10.
17. Check for 28 VDC to fuel pressure switch at P1-31 and P1-48.	If 28 VDC is not present, go to para 9-22-12.
18. Check for 28 VDC to tailwheel lock panel at P1-15.	If 28 VDC is not present, go to para 9-22-13.
19. Check for 28 VDC to navigation lights at P1-25.	If 28 VDC is not present, go to para 9-22-14.
20. Check for 28 VDC to rotor balance signal processor at P1-10.	If 28 VDC is not present, go to para 9-22-15.

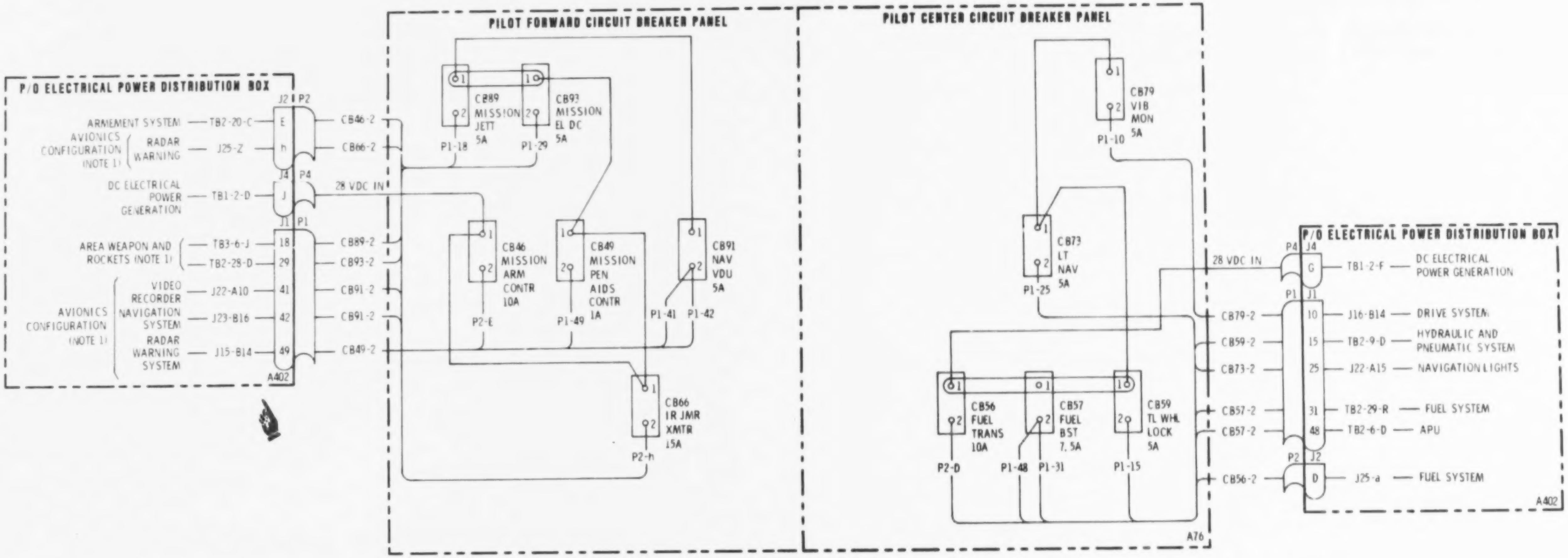
C. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.

D. Reconnect A76P1 and P2.

E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-22-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - INTERCONNECTION DIAGRAM

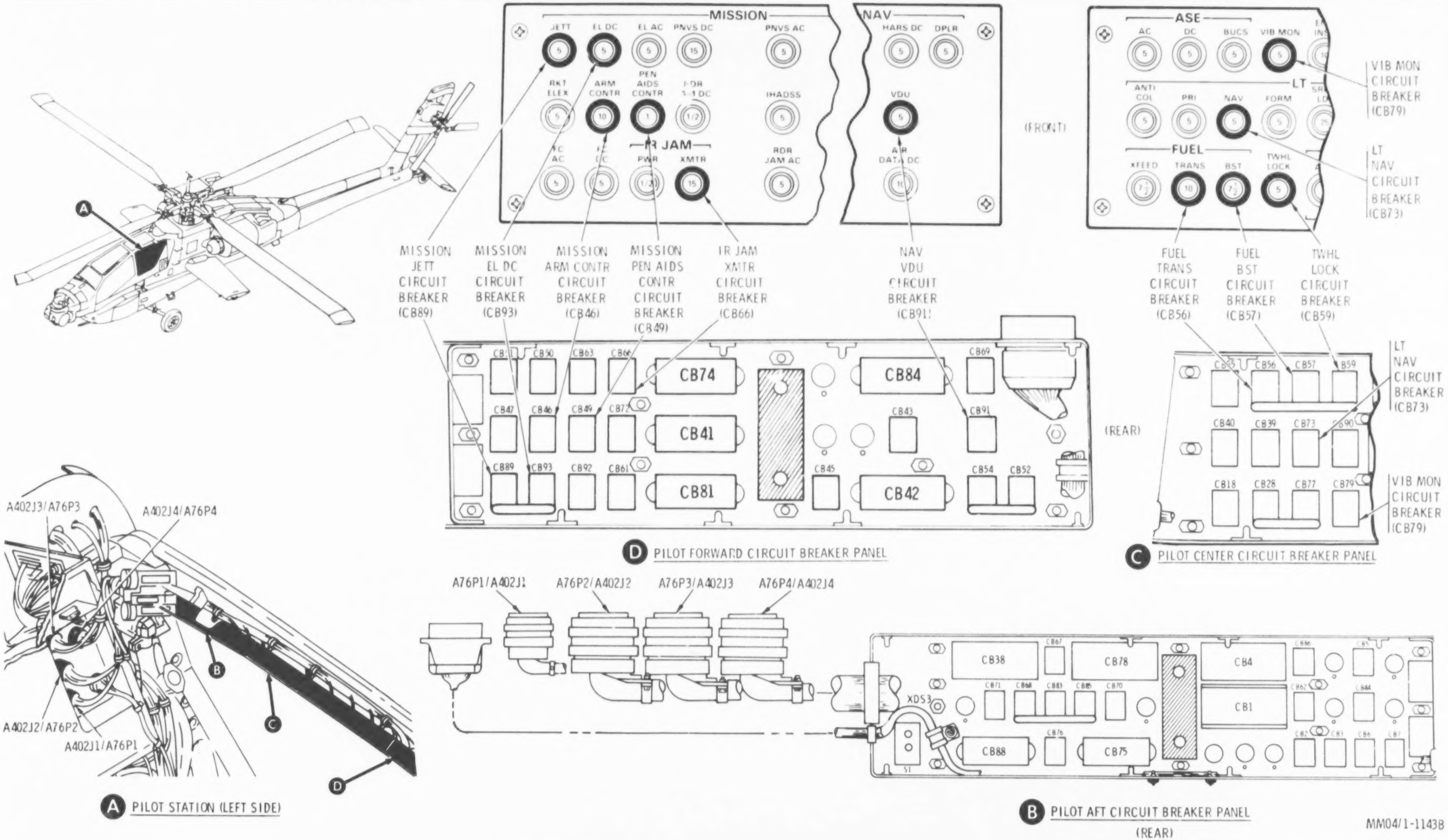


NOTE:

1. REFER TO CHAPTER 1 FOR SEPERATE TECHNICAL MANUAL.

MM04/1-765C

9-22-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 2 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



A PILOT STATION (LEFT SIDE)

B PILOT AFT CIRCUIT BREAKER PANEL (REAR)

C PILOT CENTER CIRCUIT BREAKER PANEL

D PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1143B

9-22-4. SHORT EXISTS BETWEEN GROUND AND A76P4-J OR -G

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

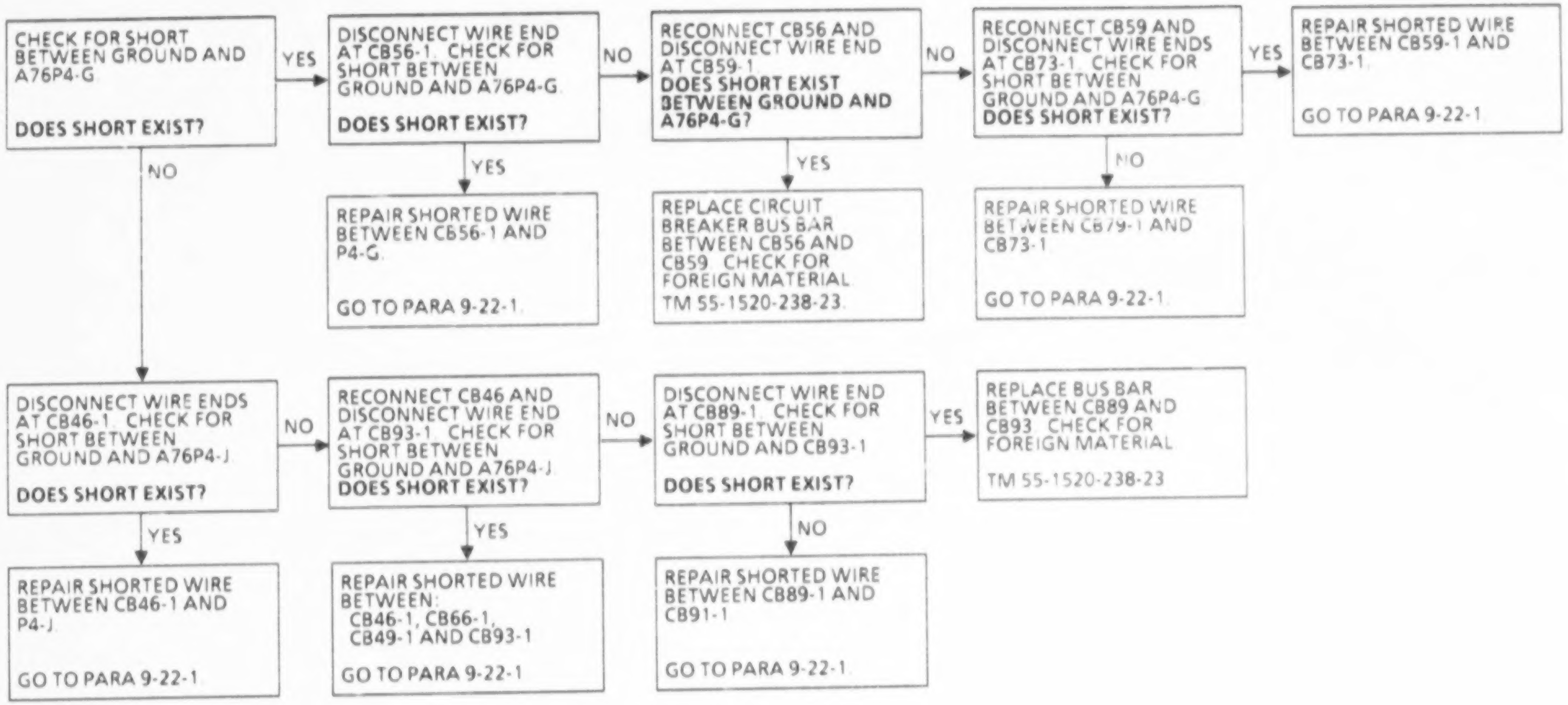
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-22-1	ALL DC essential bus 2 - pilot station circuit breakers open



CHECK FOR SHORT BETWEEN GROUND AND A76P4-G.

DOES SHORT EXIST?

DISCONNECT WIRE END AT CB56-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-G.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB56-1 AND P4-G.

GO TO PARA 9-22-1.

RECONNECT CB56 AND DISCONNECT WIRE END AT CB59-1.

DOES SHORT EXIST BETWEEN GROUND AND A76P4-G?

REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB56 AND CB59. CHECK FOR FOREIGN MATERIAL.

TM 55-1520-238-23.

RECONNECT CB59 AND DISCONNECT WIRE ENDS AT CB73-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-G.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB79-1 AND CB73-1.

GO TO PARA 9-22-1.

REPAIR SHORTED WIRE BETWEEN CB59-1 AND CB73-1.

GO TO PARA 9-22-1.

DISCONNECT WIRE ENDS AT CB46-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-J.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB46-1 AND P4-J.

GO TO PARA 9-22-1.

RECONNECT CB46 AND DISCONNECT WIRE END AT CB93-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-J.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN:
CB46-1, CB66-1,
CB49-1 AND CB93-1

GO TO PARA 9-22-1

DISCONNECT WIRE END AT CB89-1. CHECK FOR SHORT BETWEEN GROUND AND CB93-1.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB89-1 AND CB91-1.

GO TO PARA 9-22-1.

REPLACE BUS BAR BETWEEN CB89 AND CB93. CHECK FOR FOREIGN MATERIAL.

TM 55-1520-238-23

END OF TASK

9-22-5. MISSION ARM CONTR CIRCUIT BREAKER (CB46) - DOES NOT STAY CLOSED OR 28 VDC TO GROUND MAINTENANCE SWITCH IS NOT PRESENT AT P2-E

Tools: (para 9-22-4)

Personel Required: (para 9-22-4)

References:

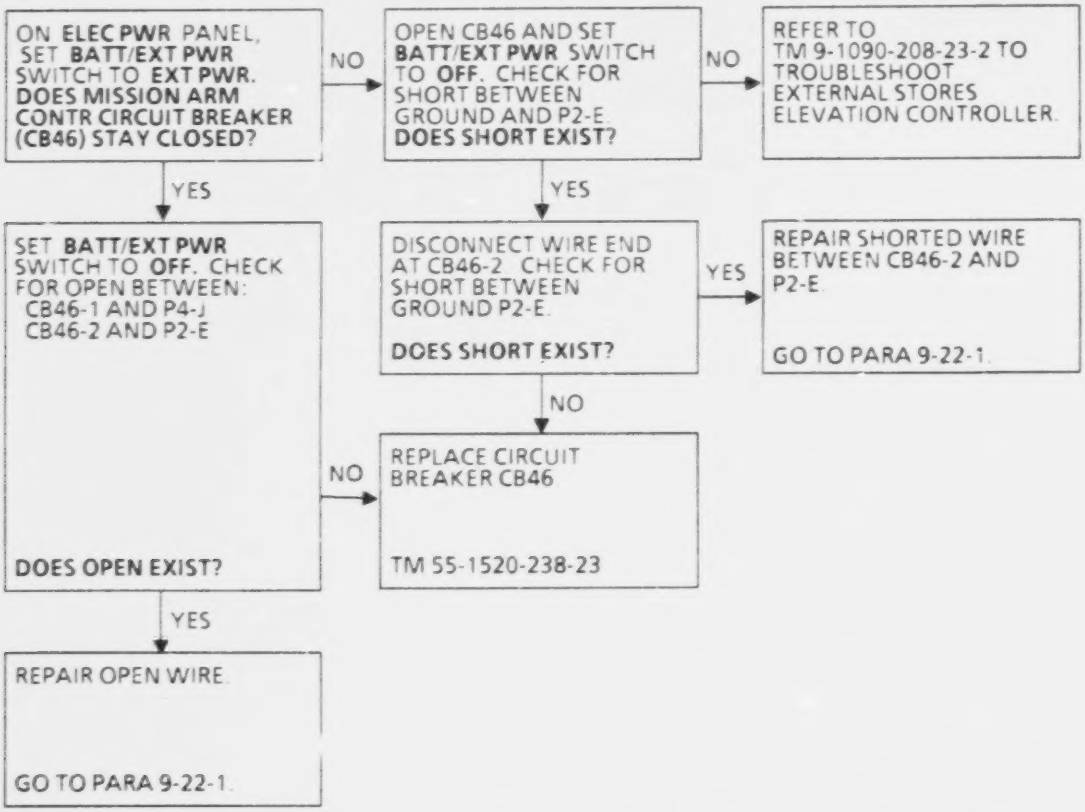
TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION ARM CONTR CIRCUIT BREAKER (CB46) STAY CLOSED?
NO
OPEN CB46 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-E. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT EXTERNAL STORES ELEVATION CONTROLLER.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB46-1 AND P4-J CB46-2 AND P2-E DOES OPEN EXIST?
DISCONNECT WIRE END AT CB46-2. CHECK FOR SHORT BETWEEN GROUND P2-E. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB46-2 AND P2-E. GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB46 TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

END OF TASK

best copy available

Reproduced from poor document.

9-22-6. IR JAM XMTR CIRCUIT BREAKER (CB) - DOES NOT STAY CLOSED OR 28 VDC TO IR JAMMER CONTROL IS NOT PRESENT AT A76P2-h

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

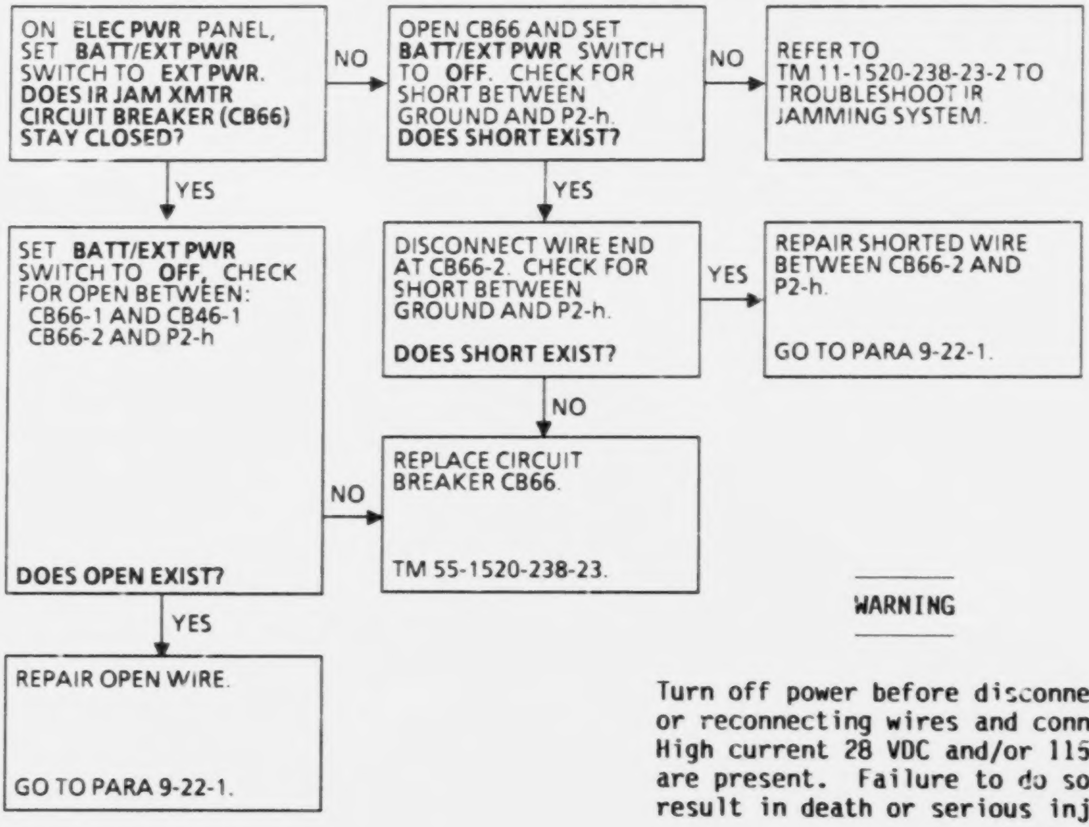
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES IR JAM XMTR CIRCUIT BREAKER (CB66) STAY CLOSED?
NO
OPEN CB66 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-h. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT IR JAMMING SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB66-1 AND CB46-1 CB66-2 AND P2-h
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB66-2. CHECK FOR SHORT BETWEEN GROUND AND P2-h.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB66-2 AND P2-h.
GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB66.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-22-7. MISSION PEN AIDS CONTR CIRCUIT BREAKER (CB49) - DOES NOT STAY CLOSED OR 28 VDC TO RADAR AND IR JAMMER CONTROLS IS NOT PRESENT AT P1-49

Tools: (para 9-22-6)

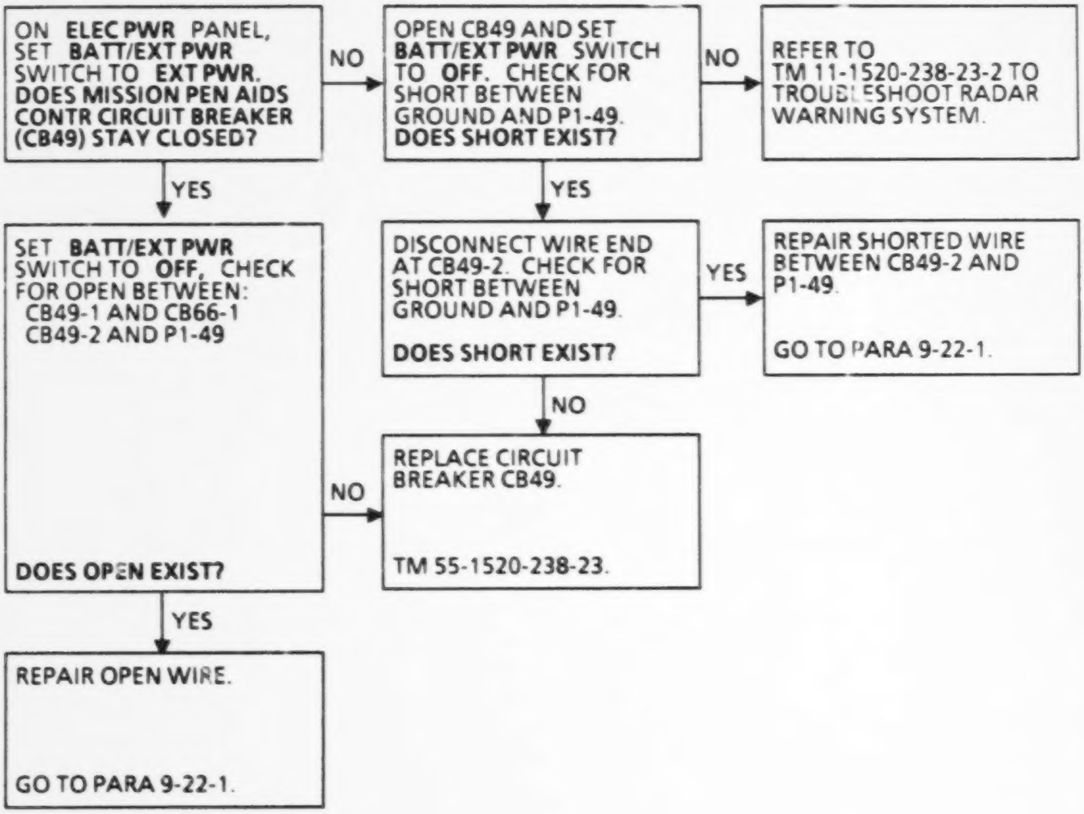
Personnel Required: (para 9-22-6)

References: (para 9-22-6)

Equipment conditions: (para 9-22-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MISSION PEN AIDS CONTR CIRCUIT BREAKER (CB49) STAY CLOSED?**
NO
OPEN CB49 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-49. **DOES SHORT EXIST?**
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR WARNING SYSTEM.
YES
YES
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB49-1 AND CB66-1
CB49-2 AND P1-49
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB49-2. CHECK FOR SHORT BETWEEN GROUND AND P1-49.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB49-2 AND P1-49.
GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB49.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-22-1.

END OF TASK

9-22-8. MISSION EL DC CIRCUIT BREAKER (CB93) - DOES NOT STAY CLOSED OR 28 VDC TO EXTERNAL STORES ELEVATION PANEL IS NOT PRESENT AT P1-29

Tools: (para 9-22-6)

Personnel Required: (para 9-22-6)

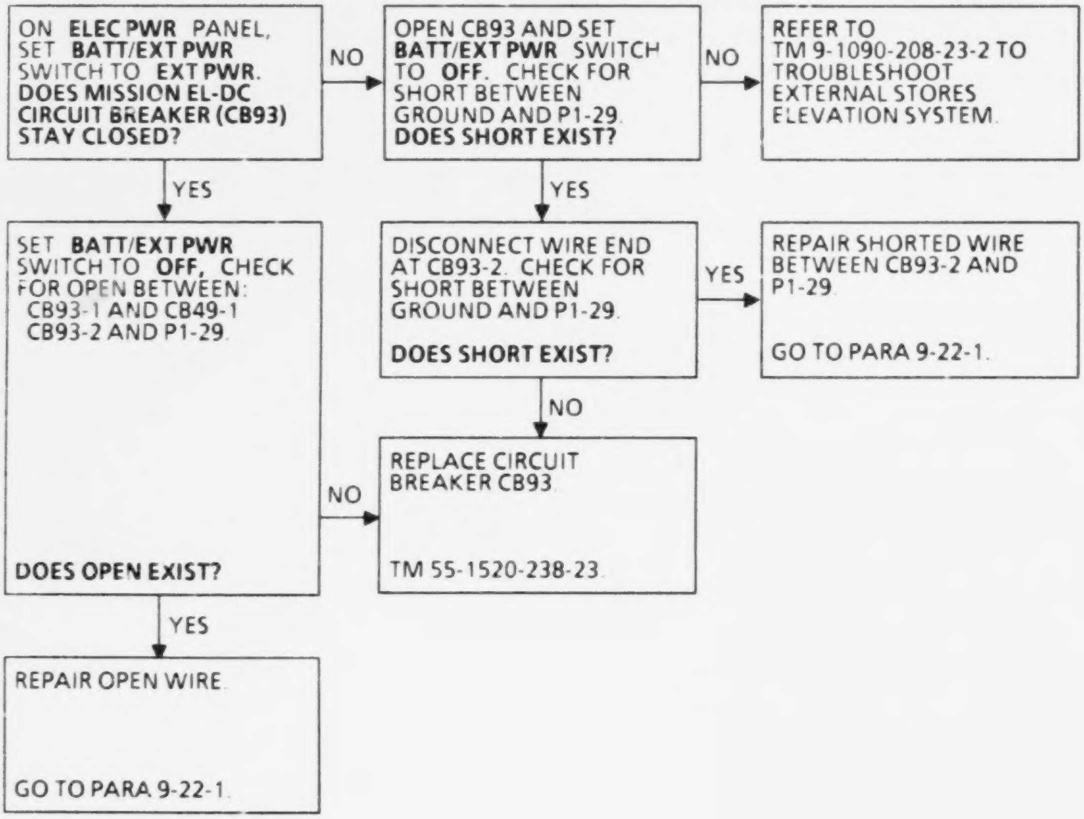
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions: (para 9-22-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MISSION EL-DC CIRCUIT BREAKER (CB93) STAY CLOSED?**

OPEN CB93 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-29. **DOES SHORT EXIST?**

REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT EXTERNAL STORES ELEVATION SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB93-1 AND CB49-1
CB93-2 AND P1-29.

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB93-2. CHECK FOR SHORT BETWEEN GROUND AND P1-29.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB93-2 AND P1-29.

GO TO PARA 9-22-1.

REPLACE CIRCUIT BREAKER CB93.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-22-1.

END OF TASK

9-22-9. MISSION JETT CIRCUIT BREAKER (CB89) - DOES NOT STAY CLOSED OR 28 VDC TO STORES JETT PANEL IS NOT PRESENT AT P1-18

Tools: (para 9-22-6)

Personnel Required: (para 9-22-6)

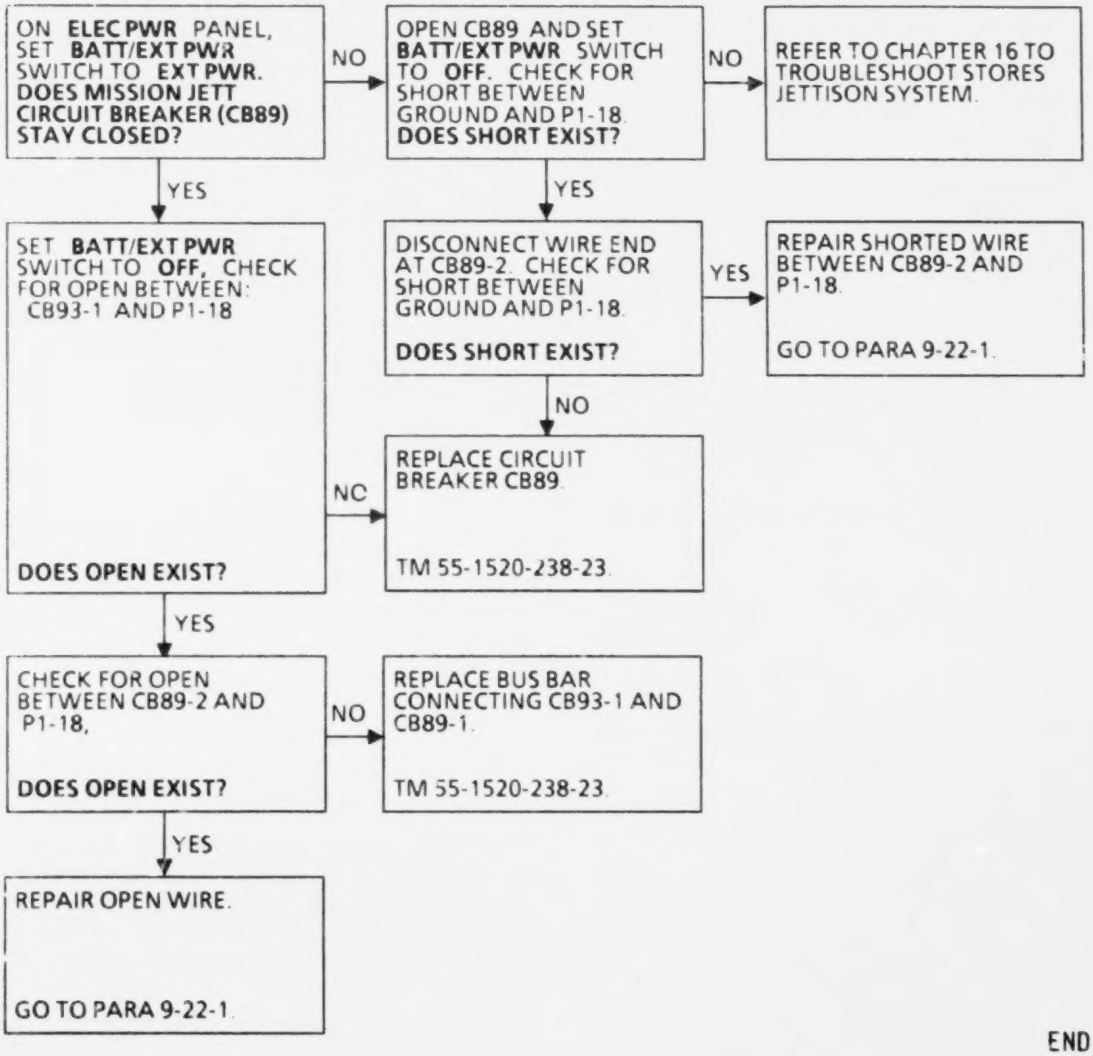
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-22-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION JETT CIRCUIT BREAKER (CB89) STAY CLOSED?
NO
OPEN CB89 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-18. DOES SHORT EXIST?
NO
REFER TO CHAPTER 16 TO TROUBLESHOOT STORES JETTISON SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB93-1 AND P1-18 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB89-2. CHECK FOR SHORT BETWEEN GROUND AND P1-18. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB89-2 AND P1-18. GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB89. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN CB89-2 AND P1-18, DOES OPEN EXIST?
NO
REPLACE BUS BAR CONNECTING CB93-1 AND CB89-1. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

END OF TASK

9-22-10. NAV VDU CIRCUIT BREAKER (CB91) - DOES NOT STAY CLOSED OR 28 VDC TO VIDEO DISPLAY UNIT IS NOT PRESENT AT P1-41, -42

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

58F10 Aircraft Electrician

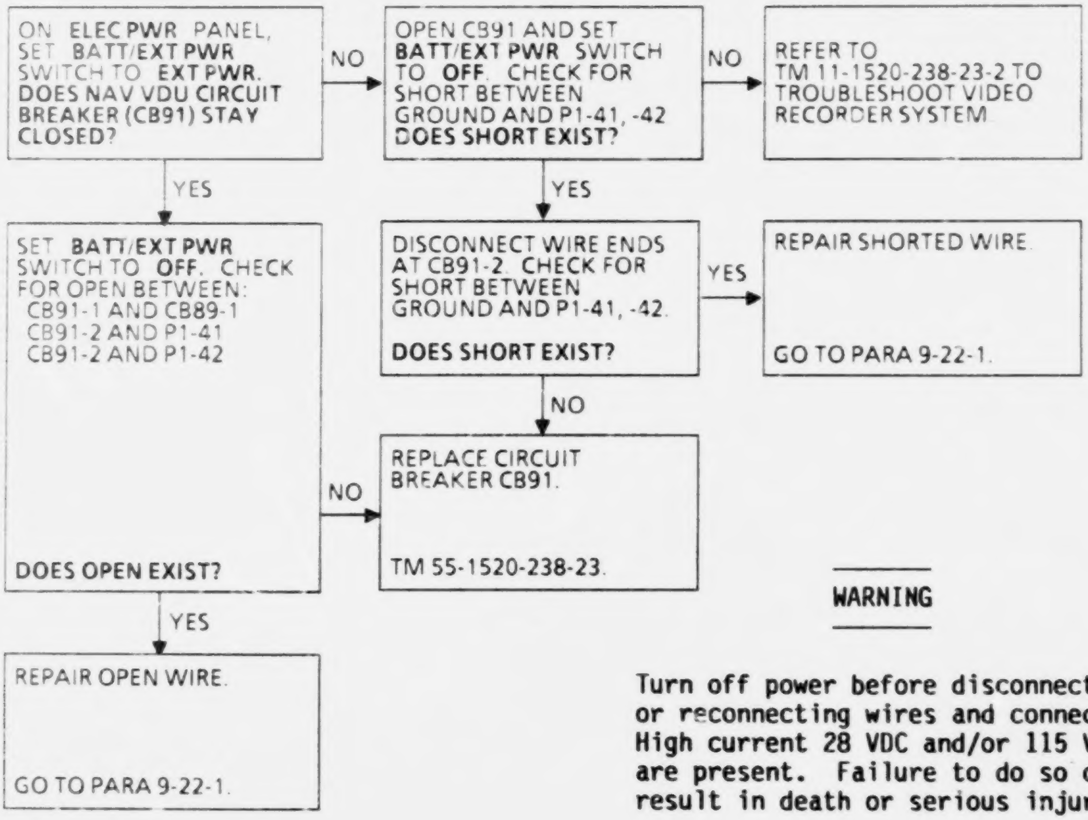
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE **WARNING**


ON ELEC PWR PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES NAV VDU CIRCUIT BREAKER (CB91) STAY CLOSED?**

NO: OPEN CB91 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-41, -42 **DOES SHORT EXIST?**

NO: REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VIDEO RECORDER SYSTEM.

YES: DISCONNECT WIRE ENDS AT CB91-2. CHECK FOR SHORT BETWEEN GROUND AND P1-41, -42. **DOES SHORT EXIST?**

YES: REPAIR SHORTED WIRE. GO TO PARA 9-22-1.

NO: REPLACE CIRCUIT BREAKER CB91. TM 55-1520-238-23.

YES: SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB91-1 AND CB89-1
CB91-2 AND P1-41
CB91-2 AND P1-42
DOES OPEN EXIST?

NO: REPLACE CIRCUIT BREAKER CB91. TM 55-1520-238-23.

YES: REPAIR OPEN WIRE. GO TO PARA 9-22-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-22-11. FUEL TRANS CIRCUIT BREAKER (CB56) DOES NOT STAY CLOSED OR 28 VDC TO PILOT FUEL PANEL IS NOT PRESENT AT P2-D

Tools: (para 9-22-10)

Personnel Required: (para 9-22-10)

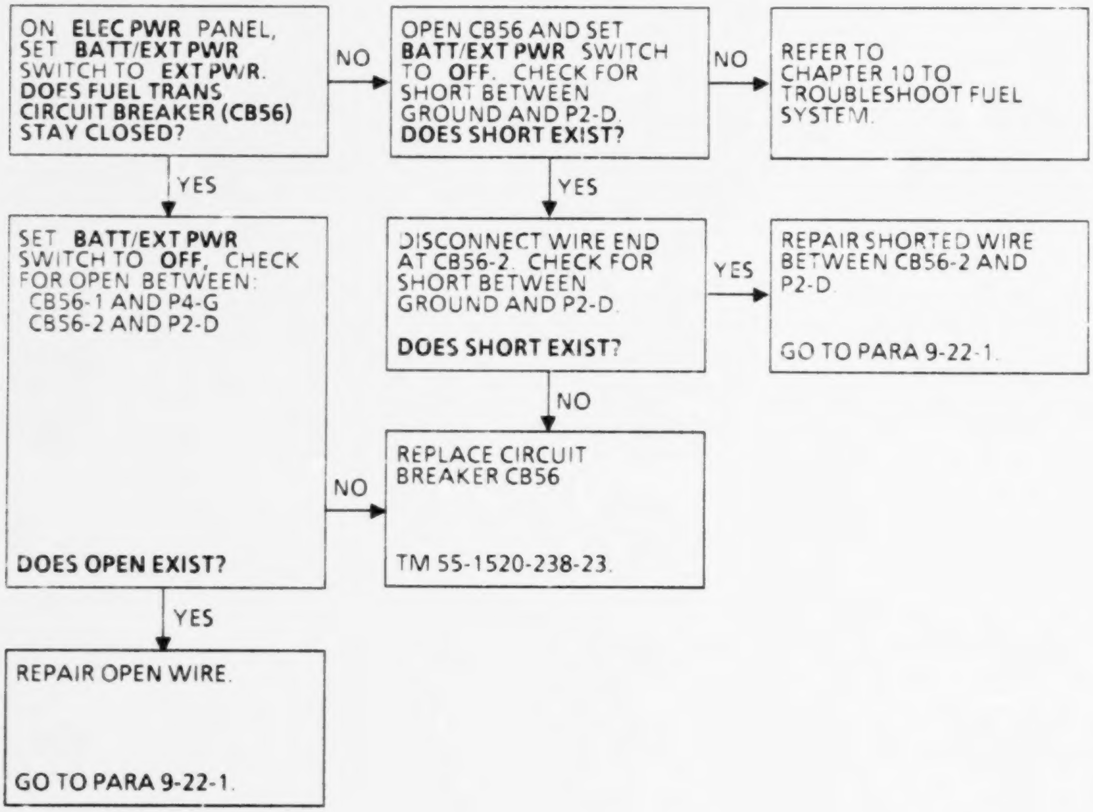
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-22-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES FUEL TRANS CIRCUIT BREAKER (CB56) STAY CLOSED?**

OPEN CB56 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P2-D. **DOES SHORT EXIST?**

REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB56-1 AND P4-G
CB56-2 AND P2-D

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB56-2. CHECK FOR SHORT BETWEEN GROUND AND P2-D.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB56-2 AND P2-D.

GO TO PARA 9-22-1.

REPLACE CIRCUIT BREAKER CB56

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-22-1.

END OF TASK

9-22-12. FUEL BST CIRCUIT BREAKER (CB57) - DOES NOT STAY CLOSED OR 28 VDC TO FUEL PRESSURE SWITCH IS NOT PRESENT AT P1-31, -48

Tools: (para 9-22-10)

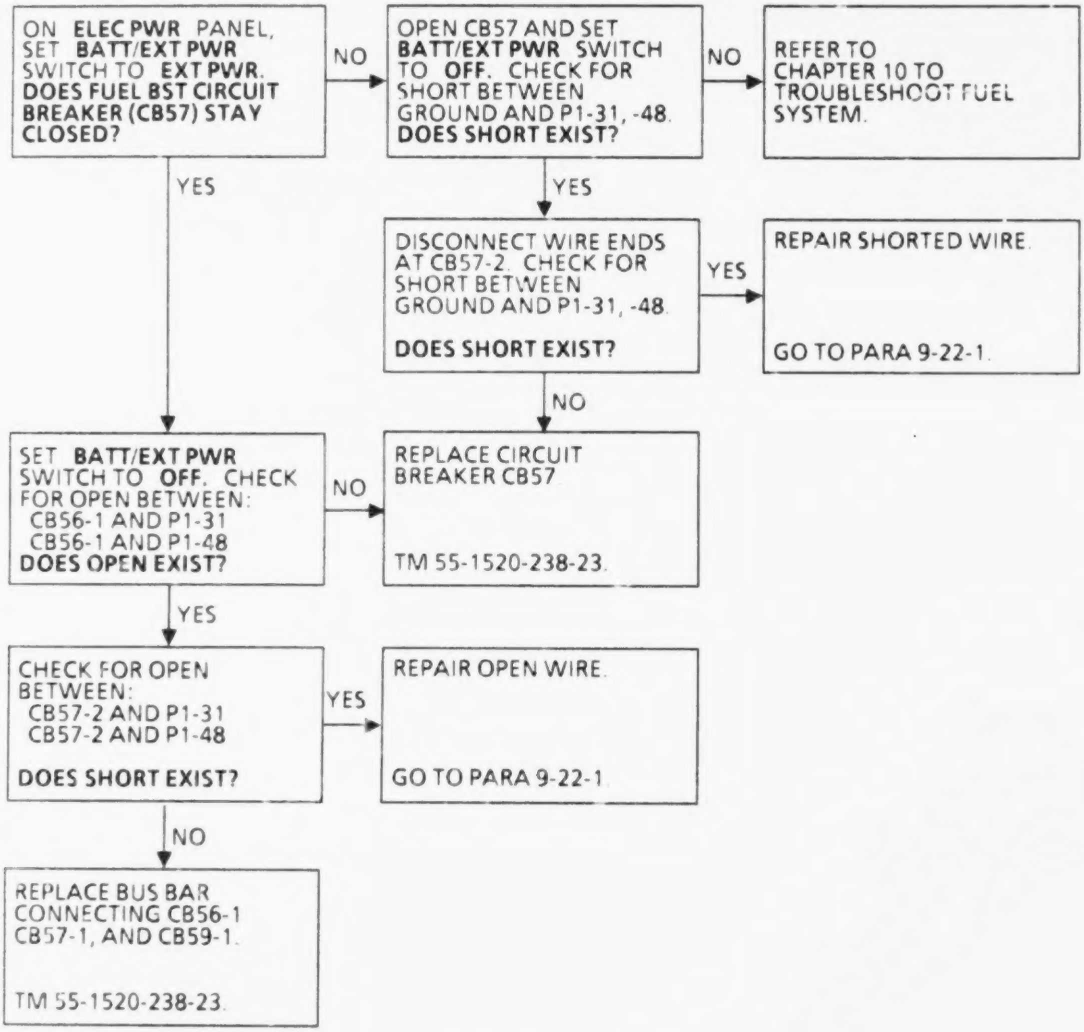
Personnel Required: (para 9-22-10)

References: (para 9-22-11)

Equipment Conditions: (para 9-22-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES FUEL BST CIRCUIT BREAKER (CB57) STAY CLOSED?**

OPEN CB57 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-31, -48. **DOES SHORT EXIST?**

REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.

DISCONNECT WIRE ENDS AT CB57-2. CHECK FOR SHORT BETWEEN GROUND AND P1-31, -48.

DOES SHORT EXIST?

REPAIR SHORTED WIRE.

GO TO PARA 9-22-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB56-1 AND P1-31
CB56-1 AND P1-48
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB57.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN:
CB57-2 AND P1-31
CB57-2 AND P1-48

DOES SHORT EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-22-1.

REPLACE BUS BAR CONNECTING CB56-1 CB57-1, AND CB59-1.

TM 55-1520-238-23.

END OF TASK

9-22-13. TWHL LOCK CIRCUIT BREAKER (CB59) - DOES NOT STAY CLOSED OR 28 VDC TO TAIL WHEEL LOCK PANEL IS NOT PRESENT AT P1-15

Tools: (para 9-22-10)

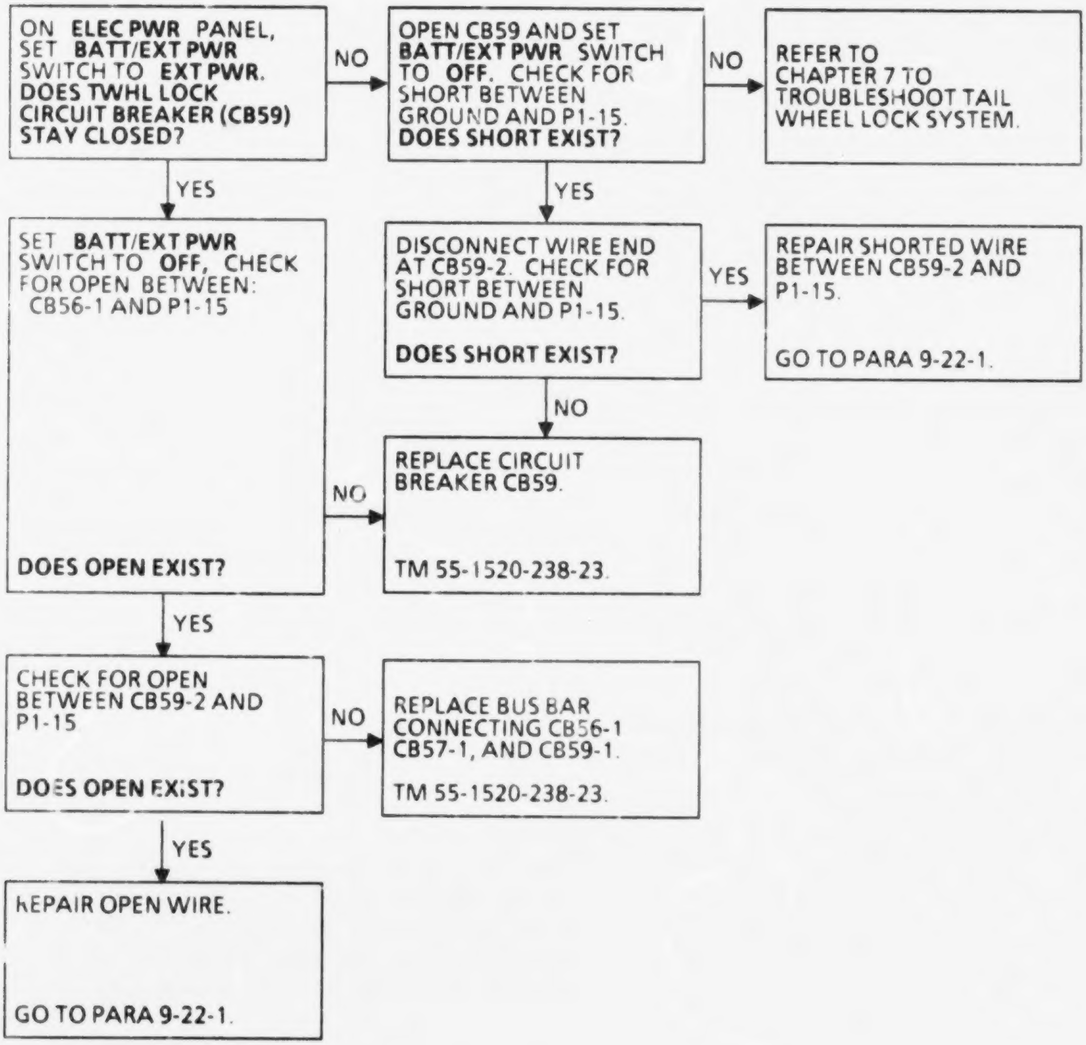
Personnel Required: (para 9-22-10)

References: (para 9-22-11)

Equipment Conditions: (para 9-22-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES TWHL LOCK CIRCUIT BREAKER (CB59) STAY CLOSED?**

OPEN CB59 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-15. **DOES SHORT EXIST?**

REFER TO CHAPTER 7 TO TROUBLESHOOT TAIL WHEEL LOCK SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN: CB56-1 AND P1-15

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB59-2. CHECK FOR SHORT BETWEEN GROUND AND P1-15.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB59-2 AND P1-15.

GO TO PARA 9-22-1.

REPLACE CIRCUIT BREAKER CB59.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN CB59-2 AND P1-15.

DOES OPEN EXIST?

REPLACE BUS BAR CONNECTING CB56-1 CB57-1, AND CB59-1.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-22-1.

END OF TASK

9-22-14. LT NAV CIRCUIT BREAKER (CB73) - DOES NOT STAY CLOSED OR 28 VDC TO NAVIGATION LIGHTS IS NOT PRESENT AT P1-25

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

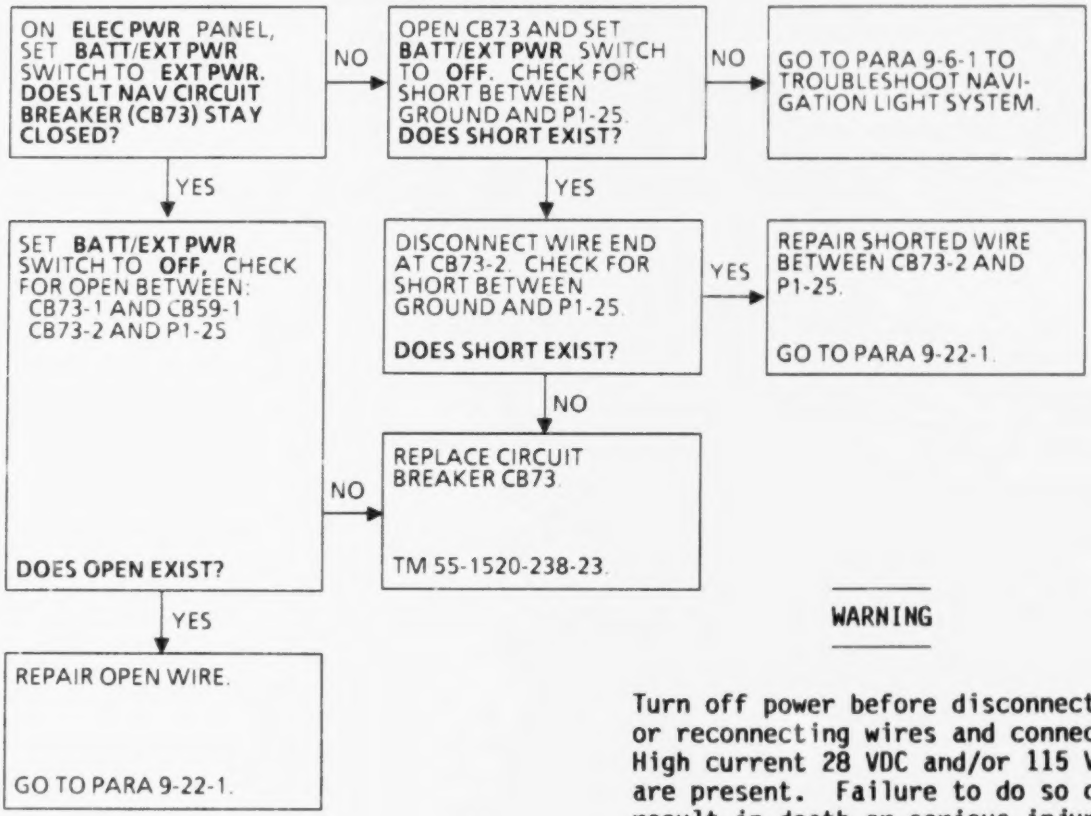
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT NAV CIRCUIT BREAKER (CB73) STAY CLOSED?
NO
OPEN CB73 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-25. DOES SHORT EXIST?
NO
GO TO PARA 9-6-1 TO TROUBLESHOOT NAVIGATION LIGHT SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB73-1 AND CB59-1 CB73-2 AND P1-25 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB73-2. CHECK FOR SHORT BETWEEN GROUND AND P1-25. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB73-2 AND P1-25. GO TO PARA 9-22-1.
NO
NO
REPLACE CIRCUIT BREAKER CB73. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-22-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-22-15. VIB MON CIRCUIT BREAKER (CB79) - DOES NOT STAY CLOSED OR 28 VDC TO ROTOR BALANCE SIGNAL PROCESSOR IS NOT PRESENT AT P1-10

Tools: (para 9-22-14)

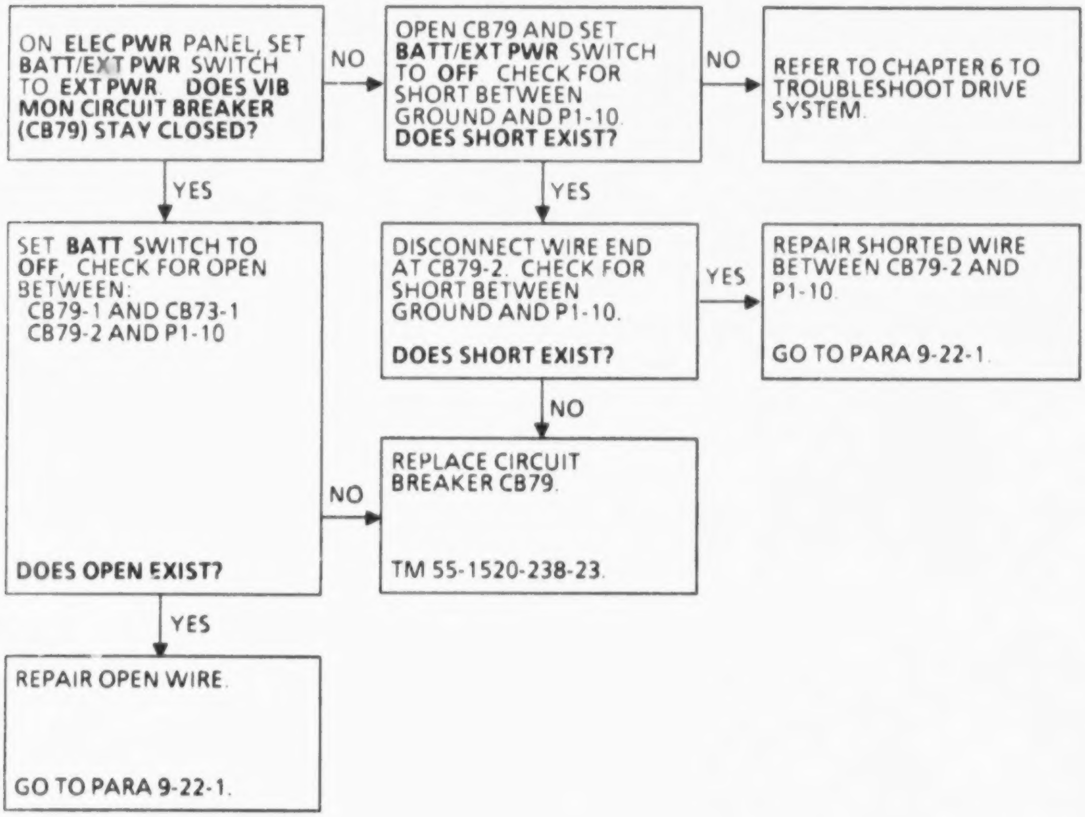
Personnel Required: (para 9-22-14)

References: (para 9-22-14)

Equipment Conditions: (para 9-22-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES VIB MON CIRCUIT BREAKER (CB79) STAY CLOSED?**

OPEN CB79 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-10. **DOES SHORT EXIST?**

REFER TO CHAPTER 6 TO TROUBLESHOOT DRIVE SYSTEM.

SET **BATT** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB79-1 AND CB73-1
CB79-2 AND P1-10

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB79-2. CHECK FOR SHORT BETWEEN GROUND AND P1-10.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB79-2 AND P1-10.

GO TO PARA 9-22-1.

REPLACE CIRCUIT BREAKER CB79.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-22-1.

9-22-15

END OF TASK

9-23-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

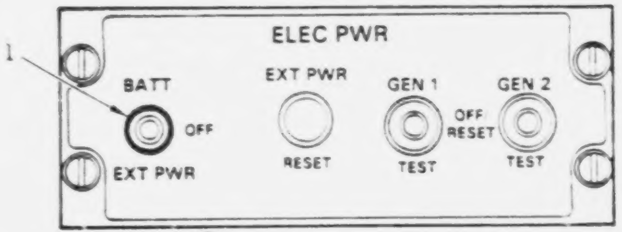
TM 55-1520-238-23

Equipment Conditions:

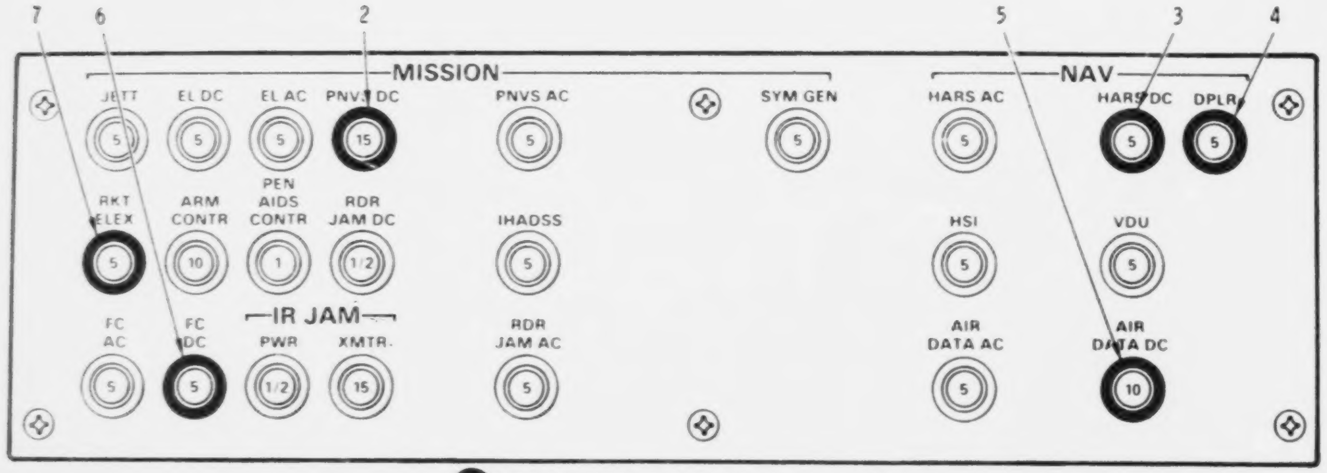
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



A PILOT ELECT PWR PANEL

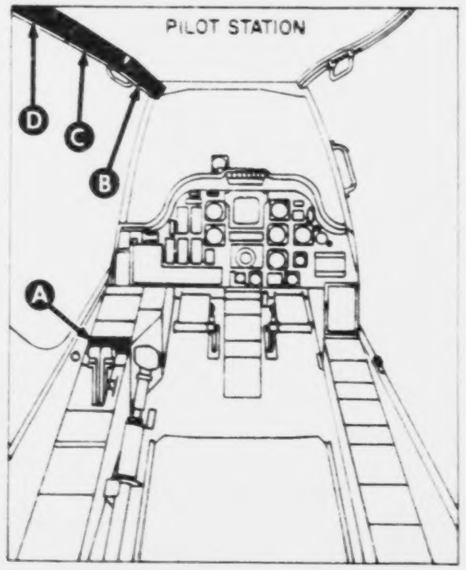


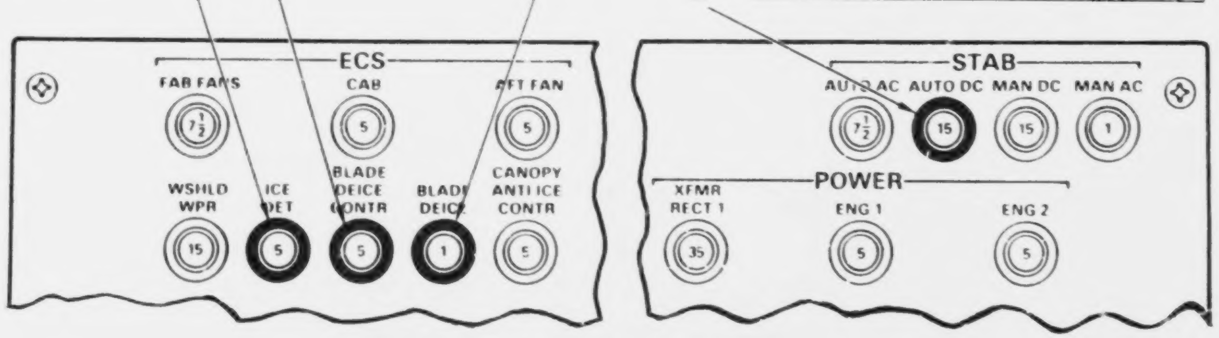
B PILOT FORWARD CIRCUIT BREAKER PANEL

A. Disconnect A76P1, P2 and P4.

B. Complete operational check as follows:

TASK	RESULT
1. Check for short between ground and A76P4-K and -L.	If short exists, go to para 9-23-4.
1.1 On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
2. Check for 28 VDC at J4-K, -L.	If 28 VDC is not present, go to para 9-3-1.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect A76P1, -P2 and -P4.	
4. On pilot circuit breaker panel check that **MISSION PNVS DC** (CB61) (2), **NAV HARS DC** (CB54) (3), **NAV DPLR** (CB82) (4), **NAV AIR DATA DC** (CB69) (5), **MISSION FC DC** (CB50) (6), **MISSION RKT ELEX** (CB47) (7), **ASE DC** (CB28) (8), **ECS ICE DET** (CB68) (9), **ECS BLADE DEICE CONTR** (CB83) (10), **ECS BLADE DEICE** (CB85) (11), and **STAB AUTO DC** (CB3) (12) circuit breakers are closed.	





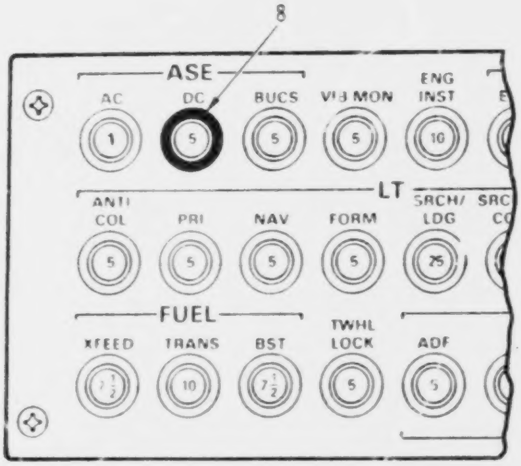
D PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1013A

GO TO NEXT PAGE

9-23-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
5. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
6. Check that circuit breakers listed in step 4 remain closed.	If CB61 (2) does not stay closed, go to para 9-23-5. If CB54 (3) does not stay closed, go to para 9-23-6. If CB82 (4) does not stay closed, go to para 9-23-7. If CB69 (5) does not stay closed, go to para 9-23-8. If CB50 (6) does not stay closed, go to para 9-23-9. If CB47 (7) does not stay closed, go to para 9-23-10. If CB28 (8) does not stay closed, go to para 9-23-11. If CB68 (9) does not stay closed, go to para 9-23-13. If CB83 (10) does not stay closed, go to para 9-23-14. If CB85 (11) does not stay closed, go to para 9-23-15. If CB3 (12) does not stay closed, go to para 9-23-16.



Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

TASK	RESULT
7. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect A76P2.	
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
9. Check for 28 VDC to PNVS electronic unit at P2-k.	If 28 VDC is not present, go to para 9-23-5.

TASK	RESULT
10. Check for 28 VDC to air data processor at P2-J.	If 28 VDC is not present, go to para 9-23-8.
11. Check for 28 VDC to stabilator control unit at P2-f.	If 28 VDC is not present, go to para 9-23-16.
12. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and connect A76P2.	
13. Disconnect A76P1, on **ELEC PWR** panel, set **BATT EXT PWR** switch (1) to **EXT PWR**.	
14. Check for 28 VDC to HARS at P1-46.	If 28 VDC is not present, go to para 9-23-6.
15. Check for 28 VDC to doppler signal data at P1-51.	If 28 VDC is not present, go to para 9-23-7.
16. Check for 28 VDC to pilot **FIRE CONTROL** panel at P1-17.	If 28 VDC is not present, go to para 9-23-9.
17. Check for 28 VDC to CPG **FIRE CONTROL** panel at P1-27.	If 28 VDC is not present, go to para 9-23-10.
18. Check for 28 VDC to **ASE** panel at P1-34.	If 28 VDC is not present, go to para 9-23-11.
19. Check for 28 VDC to ice detector signal processor at P1-47.	If 28 VDC is not present, go to para 9-23-13.
20. Check for 28 VDC to rotor blade deice controller at P1-14.	If 28 VDC is not present, go to para 9-23-14.
21. Check for 28 VDC to blade deice contactor at P1-53.	If 28 VDC is not present, go to para 9-23-15.

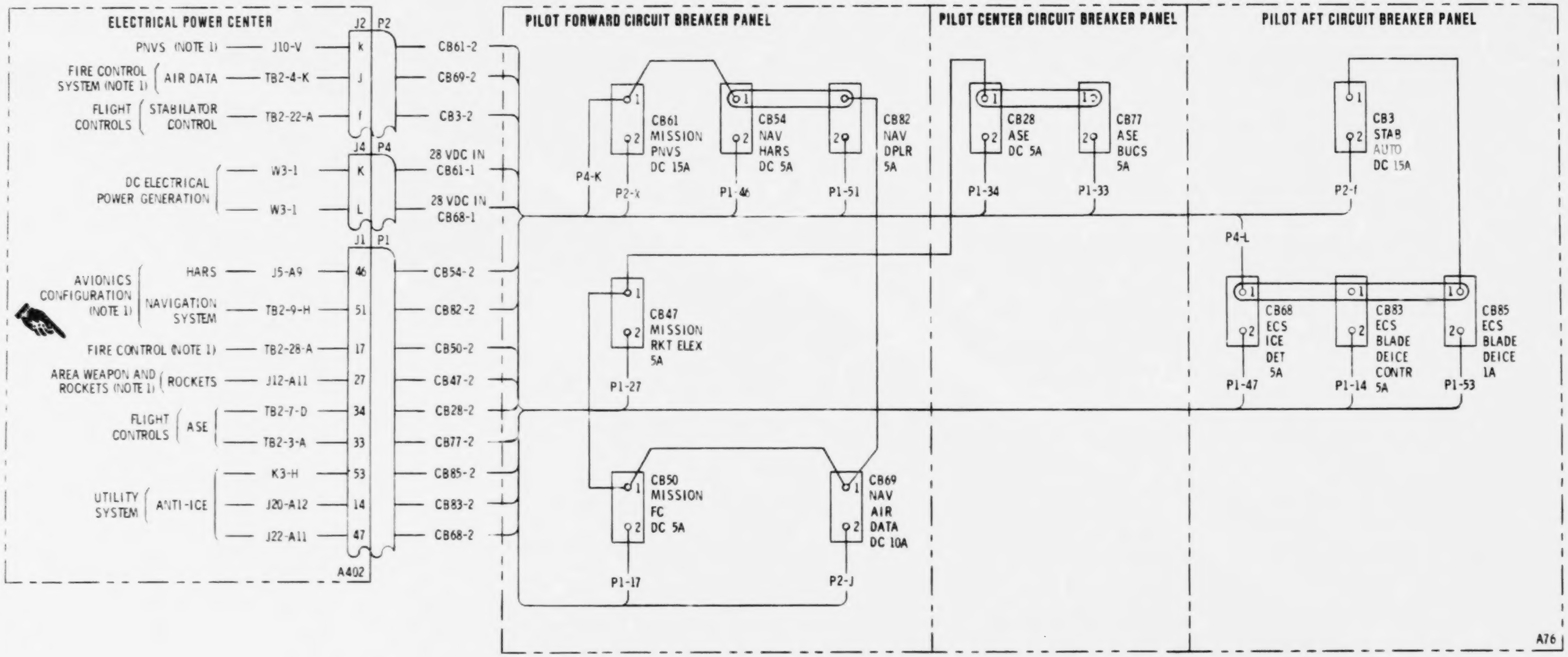
C. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.

D. Reconnect A76P1.

E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-23-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - INTERCONNECTION DIAGRAM

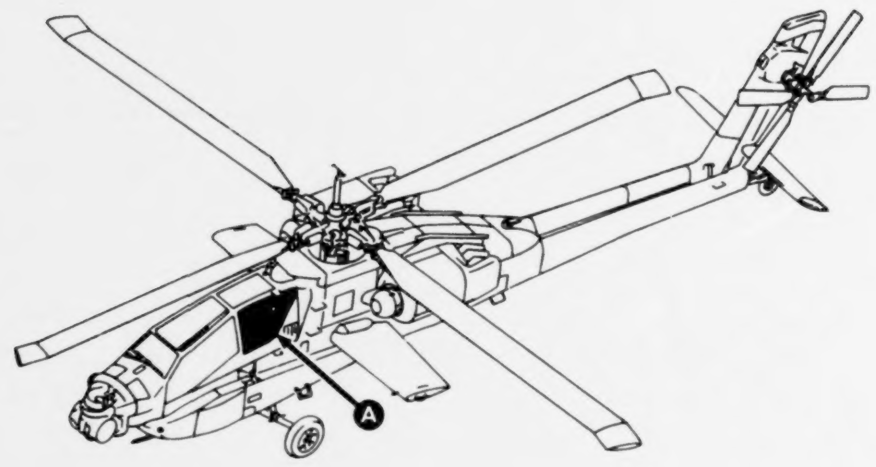


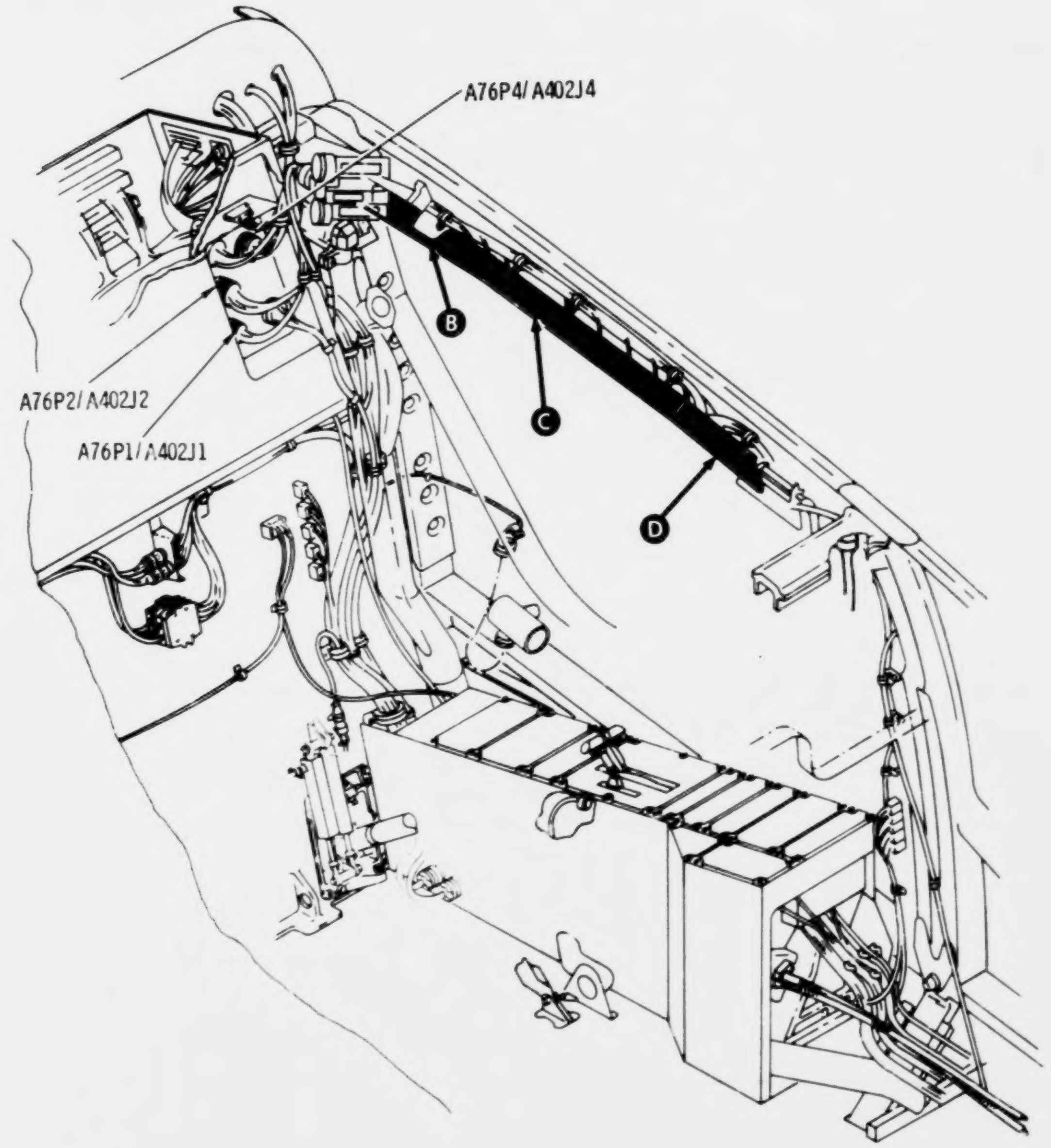
NOTES:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

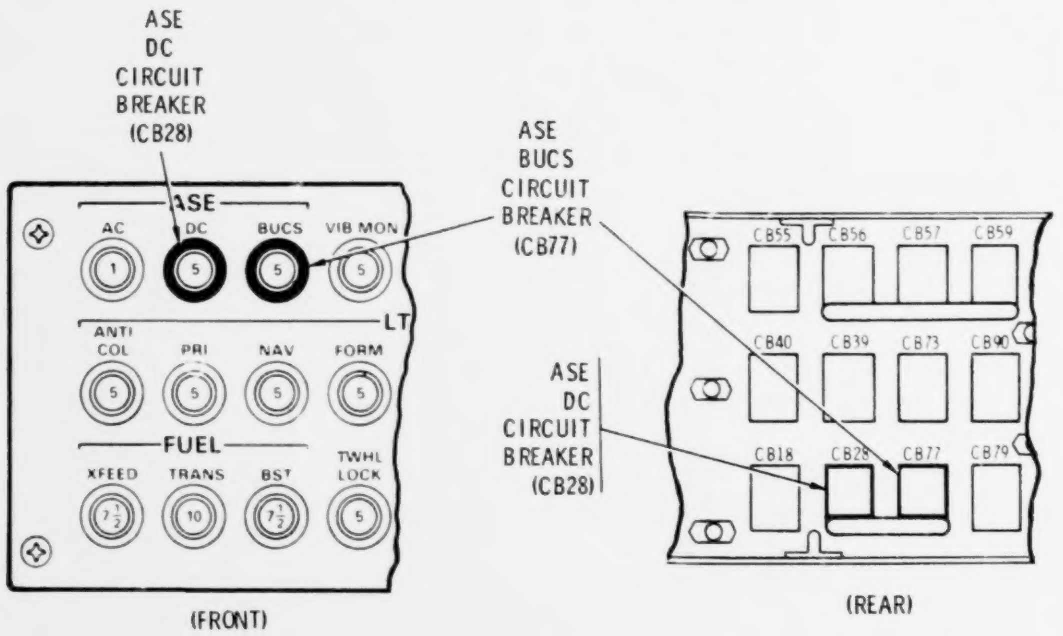
MM04/1-766B

9-23-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION





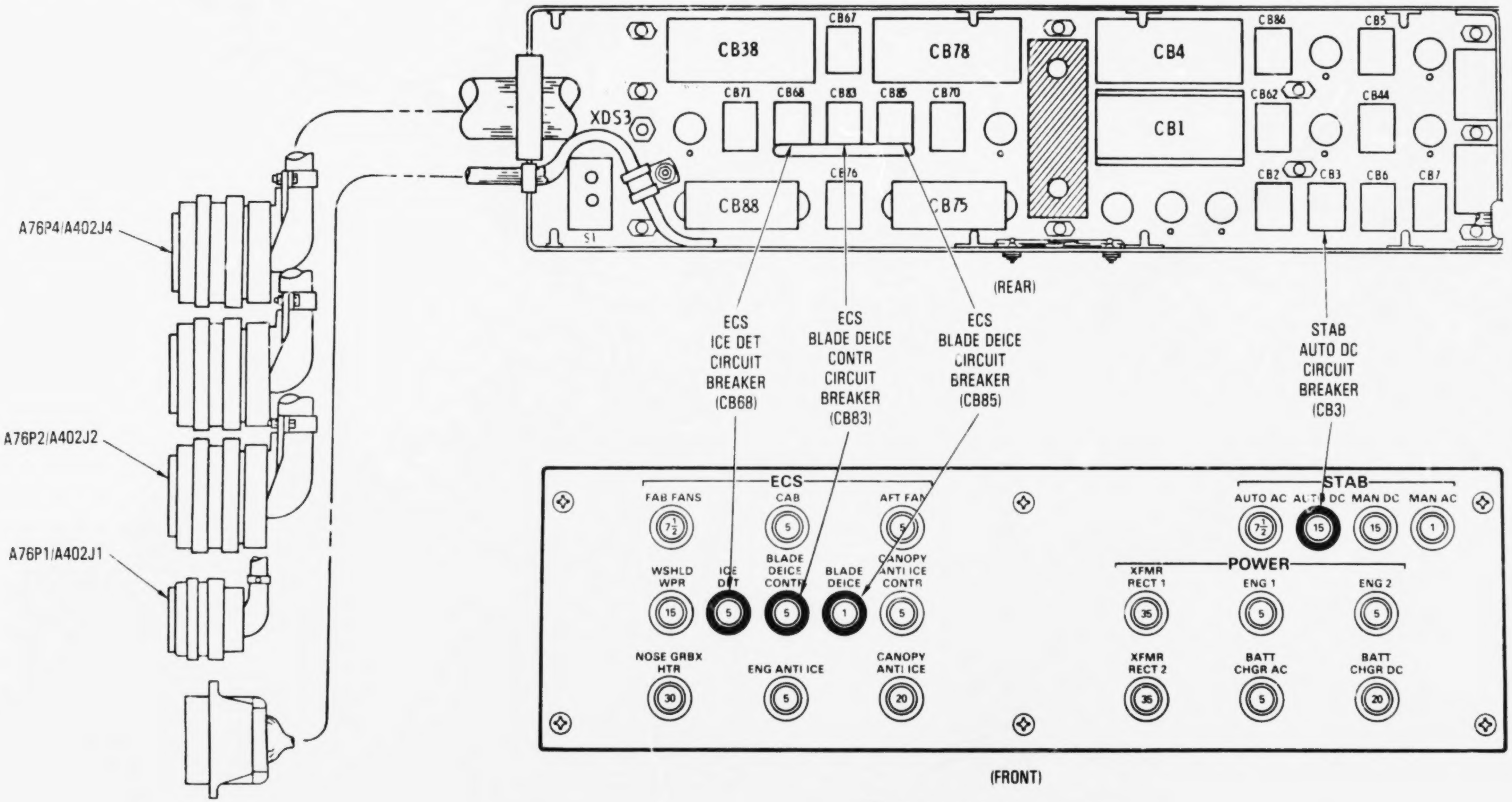
Ⓐ PILOT STATION LEFT CONSOLE



Ⓒ PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1144-1B

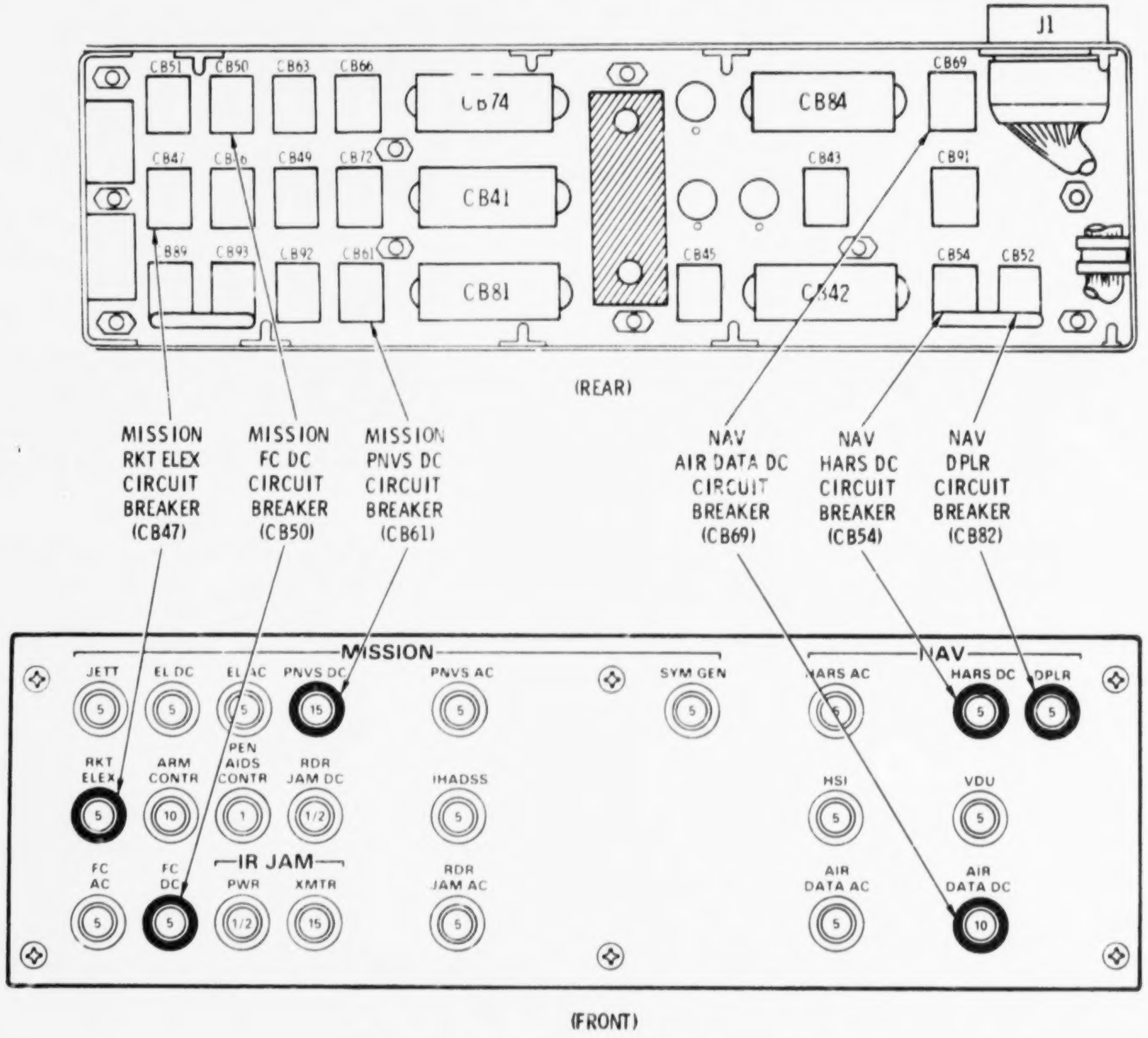
9-23-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



B PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1144-2A

9-23-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



Ⓓ PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1144-3A

9-23-4. A SHORT EXISTS BETWEEN GROUND AND A76P4-L OR -K

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

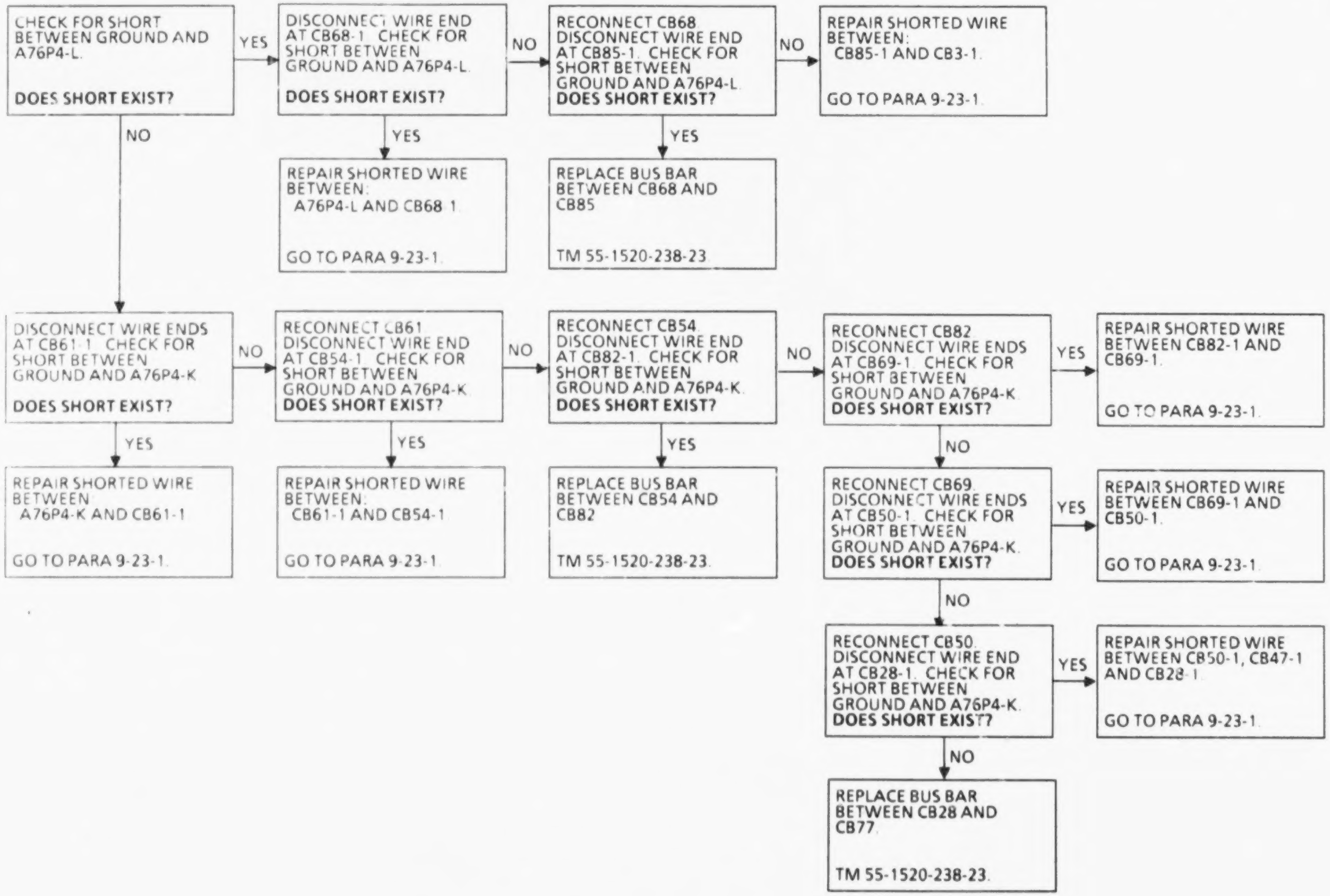
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-23-1	All DC essential bus 3 - pilot station circuit breakers open


CHECK FOR SHORT BETWEEN GROUND AND A76P4-L. DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB68-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-L. DOES SHORT EXIST?
NO
RECONNECT CB68 DISCONNECT WIRE END AT CB85-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-L. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN: CB85-1 AND CB3-1. GO TO PARA 9-23-1.
YES
REPAIR SHORTED WIRE BETWEEN: A76P4-L AND CB68-1. GO TO PARA 9-23-1.
YES
REPLACE BUS BAR BETWEEN CB68 AND CB85. TM 55-1520-238-23.
NO
DISCONNECT WIRE ENDS AT CB61-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
NO
RECONNECT CB61 DISCONNECT WIRE END AT CB54-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
NO
RECONNECT CB54 DISCONNECT WIRE END AT CB82-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
NO
RECONNECT CB82 DISCONNECT WIRE ENDS AT CB69-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB82-1 AND CB69-1. GO TO PARA 9-23-1.
YES
REPAIR SHORTED WIRE BETWEEN: A76P4-K AND CB61-1. GO TO PARA 9-23-1.
YES
REPAIR SHORTED WIRE BETWEEN: CB61-1 AND CB54-1. GO TO PARA 9-23-1.
YES
REPLACE BUS BAR BETWEEN CB54 AND CB82. TM 55-1520-238-23.
NO
RECONNECT CB69. DISCONNECT WIRE ENDS AT CB50-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB69-1 AND CB50-1. GO TO PARA 9-23-1.
NO
RECONNECT CB50. DISCONNECT WIRE END AT CB28-1. CHECK FOR SHORT BETWEEN GROUND AND A76P4-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB50-1, CB47-1 AND CB28-1. GO TO PARA 9-23-1.
NO
REPLACE BUS BAR BETWEEN CB28 AND CB77. TM 55-1520-238-23.

END OF TASK

9-23-5. MISSION PNVS DC CIRCUIT BREAKER (CB61) - DOES NOT STAY CLOSED OR 28 VDC TO PNVS ELECTRONIC UNIT IS NOT PRESENT AT P2-k

Tools: (para 9-23-4)

Personnel Required: (para 9-23-4)

References:

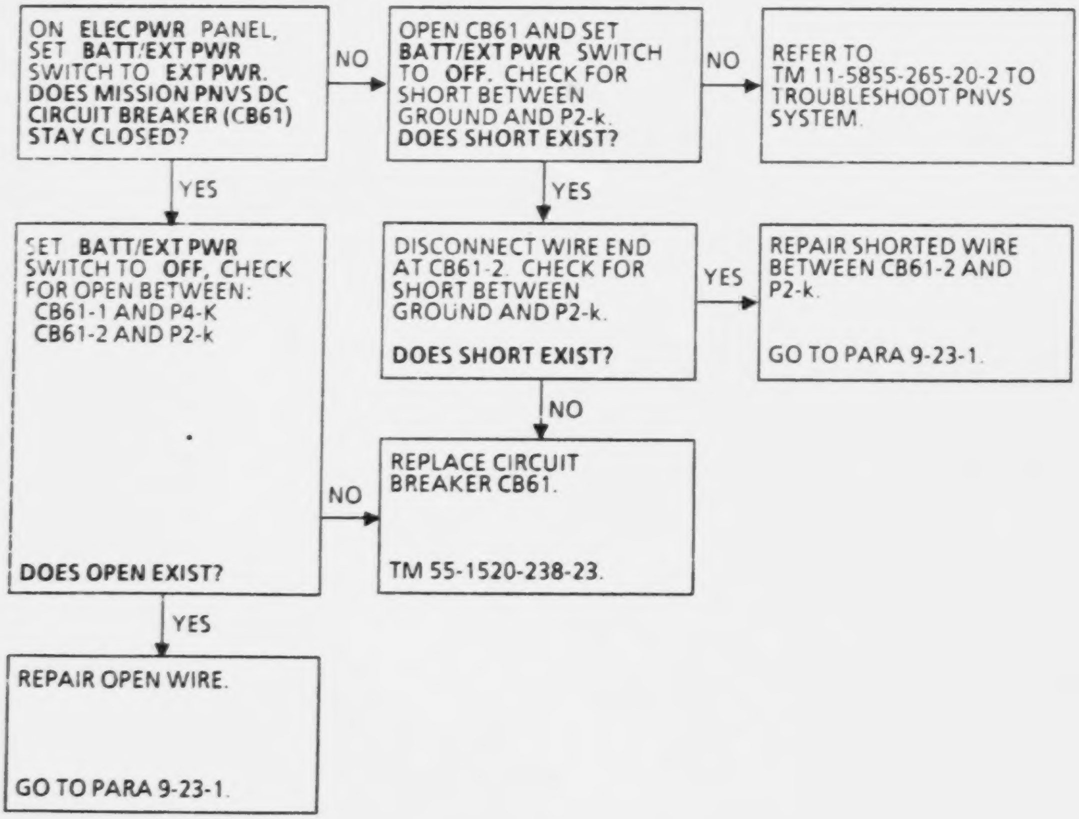
TM 55-1520-238-23
TM 11-5855-265-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MISSION PNVS DC CIRCUIT BREAKER (CB61) STAY CLOSED?
NO
OPEN CB61 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-k. DOES SHORT EXIST?
NO
REFER TO TM 11-5855-265-20-2 TO TROUBLESHOOT PNVS SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB61-1 AND P4-K CB61-2 AND P2-k
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB61-2. CHECK FOR SHORT BETWEEN GROUND AND P2-k.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB61-2 AND P2-k.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB61.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-6. NAV HARS DC CIRCUIT BREAKER (CB54) - DOES NOT STAY CLOSED OR 28 VDC TO HARS IS NOT PRESENT AT P1-46

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

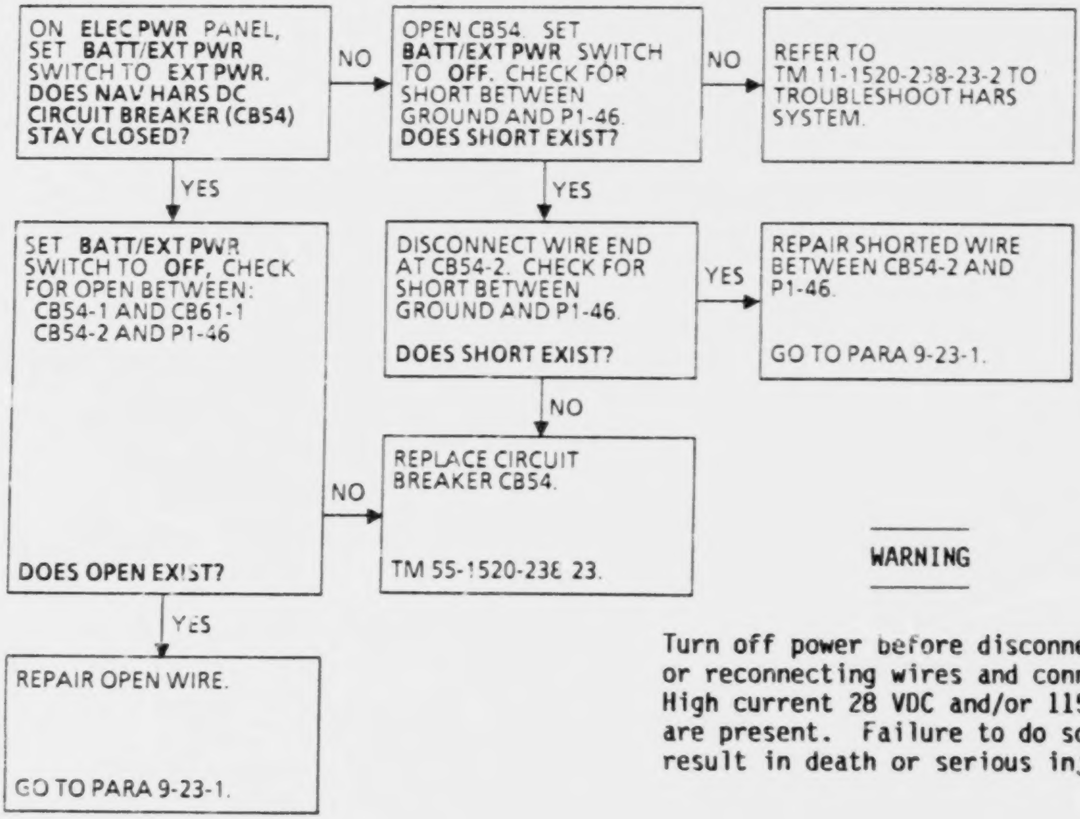
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES NAV HARS DC CIRCUIT BREAKER (CB54) STAY CLOSED?**

OPEN CB54. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-46. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT HARS SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB54-1 AND CB61-1
CB54-2 AND P1-46

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB54-2. CHECK FOR SHORT BETWEEN GROUND AND P1-46.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB54-2 AND P1-46.

GO TO PARA 9-23-1.

REPLACE CIRCUIT BREAKER CB54.

TM 55-1520-238 23.

REPAIR OPEN WIRE.

GO TO PARA 9-23-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-23-7. NAV DPLR CIRCUIT BREAKER (CB82) - DOES NOT STAY CLOSED OR 28 VDC TO DOPPLER SIGNAL DATA COMPARATOR IS NOT PRESENT AT P1-51

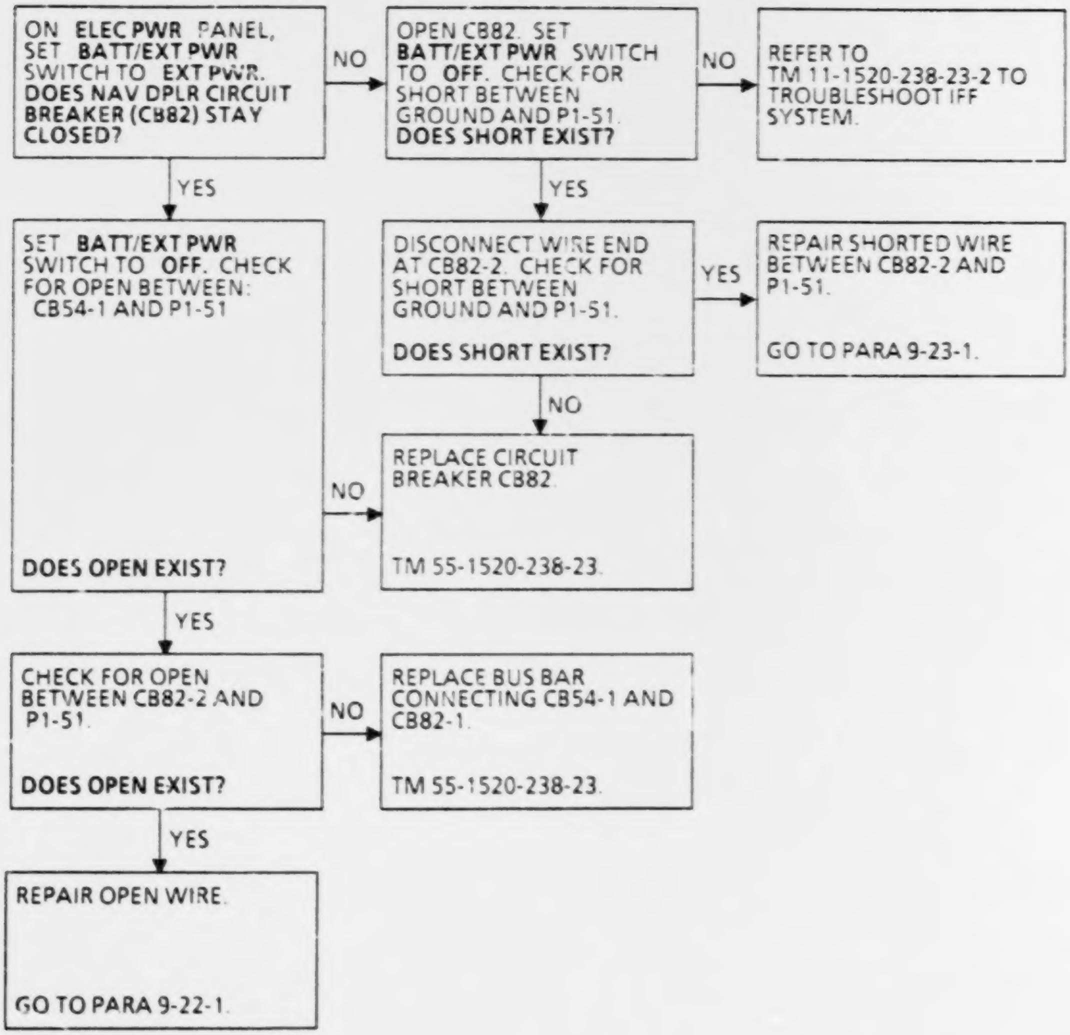
Tools: (para 9-23-6)

Personnel Required: (para 9-23-6)

References: (para 9-23-6)

Equipment Conditions: (para 9-23-6)

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES NAV DPLR CIRCUIT BREAKER (CB82) STAY CLOSED?**

OPEN CB82. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-51. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT IFF SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN: CB54-1 AND P1-51

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB82-2. CHECK FOR SHORT BETWEEN GROUND AND P1-51.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB82-2 AND P1-51.

GO TO PARA 9-23-1.

REPLACE CIRCUIT BREAKER CB82.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN CB82-2 AND P1-51.

DOES OPEN EXIST?

REPLACE BUS BAR CONNECTING CB54-1 AND CB82-1.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-22-1.

END OF TAS

9-23-8. NAV AIR DATA DC CIRCUIT BREAKER (CB69) - DOES NOT STAY CLOSED OR 28 VDC TO AIR DATA PROCESSOR IS NOT PRESENT AT P2-J

Tools: (para 9-23-6)

Personnel Required: (para 9-23-6)

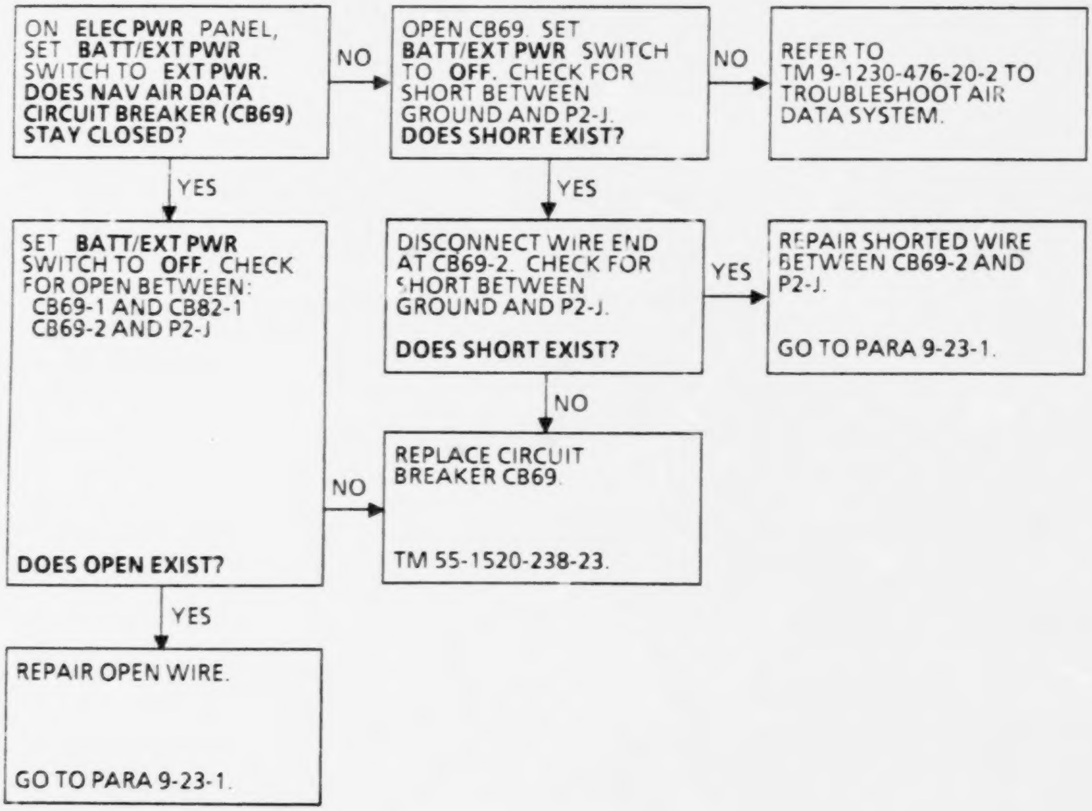
References:

TM 9-1230-476-20-2
TM 55-1520-238-23

Equipment Conditions: (par 9-23-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES NAV AIR DATA CIRCUIT BREAKER (CB69) STAY CLOSED?
NO
OPEN CB69. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-J. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT AIR DATA SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB69-1 AND CB82-1 CB69-2 AND P2-J
DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB69-2. CHECK FOR SHORT BETWEEN GROUND AND P2-J.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB69-2 AND P2-J.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB69.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-23-9. MISSION FC DC CIRCUIT BREAKER (CB50) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE CONTROL PANEL IS NOT PRESENT AT P1-17

Tools: (para 9-23-6)

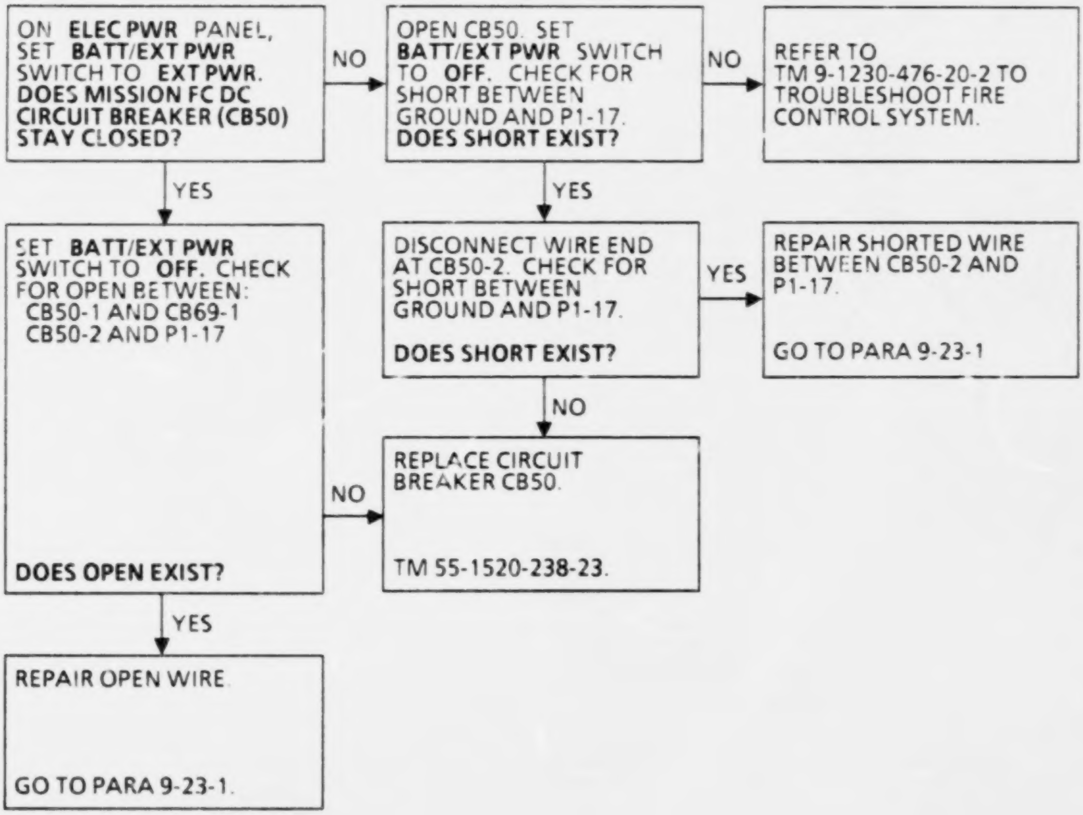
Personnel Required: (para 9-23-6)

References: (para 9-23-8)

Equipment Conditions: (para 9-23-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES MISSION FC DC CIRCUIT BREAKER (CB50) STAY CLOSED?**

OPEN CB50. SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND P1-17. **DOES SHORT EXIST?**

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR OPEN BETWEEN:
CB50-1 AND CB69-1
CB50-2 AND P1-17

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB50-2. CHECK FOR SHORT BETWEEN GROUND AND P1-17.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB50-2 AND P1-17.

GO TO PARA 9-23-1

REPLACE CIRCUIT BREAKER CB50.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-23-1.

END OF TASK

9-23-10. MISSION RKT ELEX CIRCUIT BREAKER (CB47) - DOES NOT STAY CLOSED 28 VDC TO CPG FIRE CONTROL PANEL IS NOT PRESENT AT P1-27

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

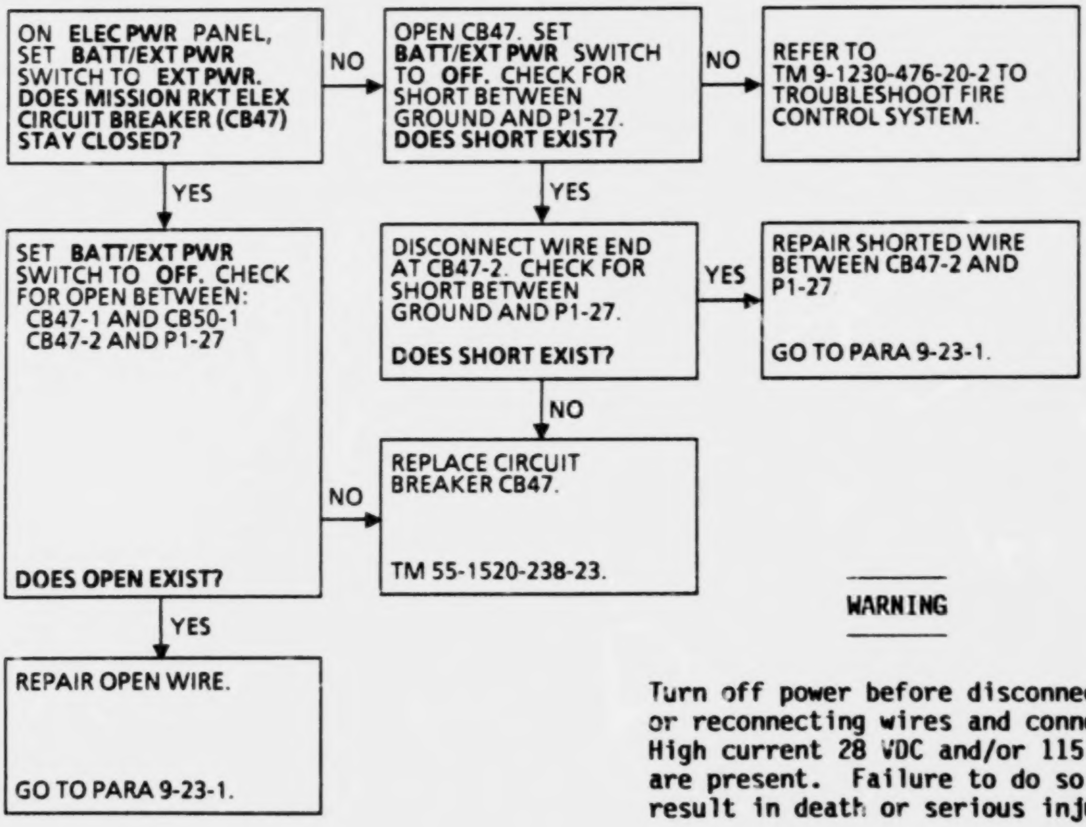
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES MISSION RKT ELEX CIRCUIT BREAKER (CB47) STAY CLOSED?**

OPEN CB47. SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND P1-27. **DOES SHORT EXIST?**

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR OPEN BETWEEN:
CB47-1 AND CB50-1
CB47-2 AND P1-27

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB47-2. CHECK FOR SHORT BETWEEN GROUND AND P1-27.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB47-2 AND P1-27

GO TO PARA 9-23-1.

REPLACE CIRCUIT BREAKER CB47.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-23-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-23-11. ASE DC CIRCUIT BREAKER (CB28) - DOES NOT STAY CLOSED OR 28 VDC TO ASE PANEL IS NOT PRESENT AT P1-34

Tools: (para 9-23-10)

Personnel Required: (para 9-23-10)

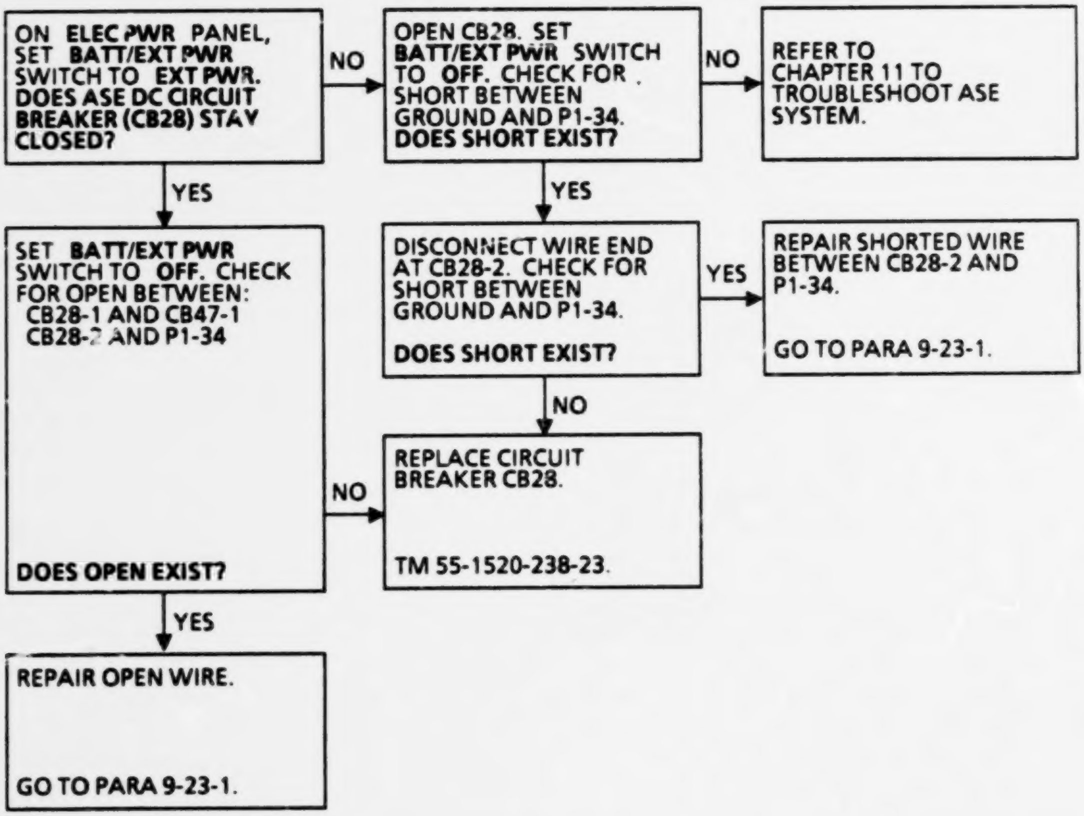
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-23-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ASE DC CIRCUIT BREAKER (CB28) STAY CLOSED?

OPEN CB28. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-34. DOES SHORT EXIST?

REFER TO CHAPTER 11 TO TROUBLESHOOT ASE SYSTEM.

SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB28-1 AND CB47-1
CB28-2 AND P1-34

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB28-2. CHECK FOR SHORT BETWEEN GROUND AND P1-34.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB28-2 AND P1-34.

GO TO PARA 9-23-1.

REPLACE CIRCUIT BREAKER CB28.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-23-1.

END OF TASK

9-23-12. ASE BUCS CIRCUIT BREAKER (CB77) - DOES NOT STAY CLOSED OR 28 VDC TO DASEC IS NOT PRESENT AT P1-33

Paragraph 9-23-12 deleted.

9-23-13. ECS ICE DET CIRCUIT BREAKER (CB68) - DOES NOT STAY CLOSED OR 28 VDC TO ICE DETECTOR SIGNAL PROCESSOR IS NOT PRESENT AT P1-47

Tools: (para 9-23-10)

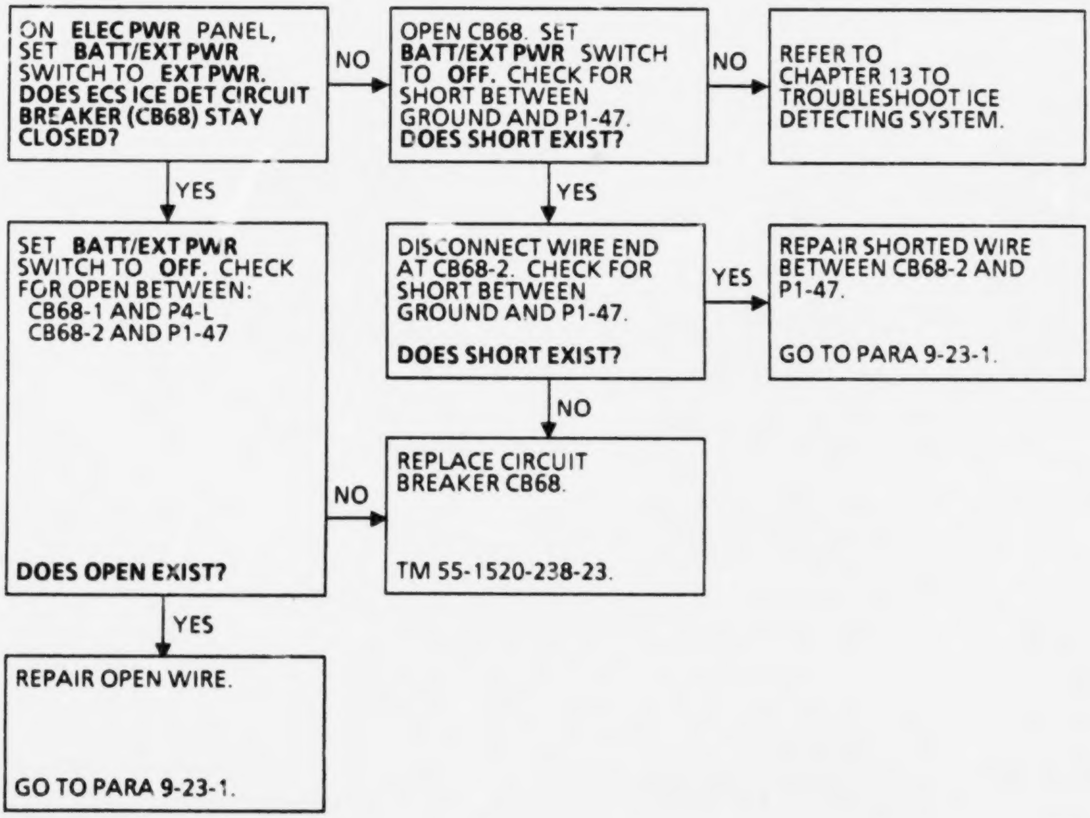
Personnel Required: (para 9-23-10)

References: (para 9-23-11)

Equipment Conditions: (para 9-23-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ECS ICE DET CIRCUIT BREAKER (CB68) STAY CLOSED?
NO
OPEN CB68. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P1-47. DOES SHORT EXIST?
NO
REFER TO CHAPTER 13 TO TROUBLESHOOT ICE DETECTING SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB68-1 AND P4-L CB68-2 AND P1-47 DOES OPEN EXIST?
DISCONNECT WIRE END AT CB68-2. CHECK FOR SHORT BETWEEN GROUND AND P1-47. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB68-2 AND P1-47. GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB68. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-23-1.

END OF TASK

9-23-16. STAB AUTO DC CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR 28 VDC TO STABILATOR CONTROL UNIT IS NOT PRESENT AT P2-f

Tools: (para 9-22-14)

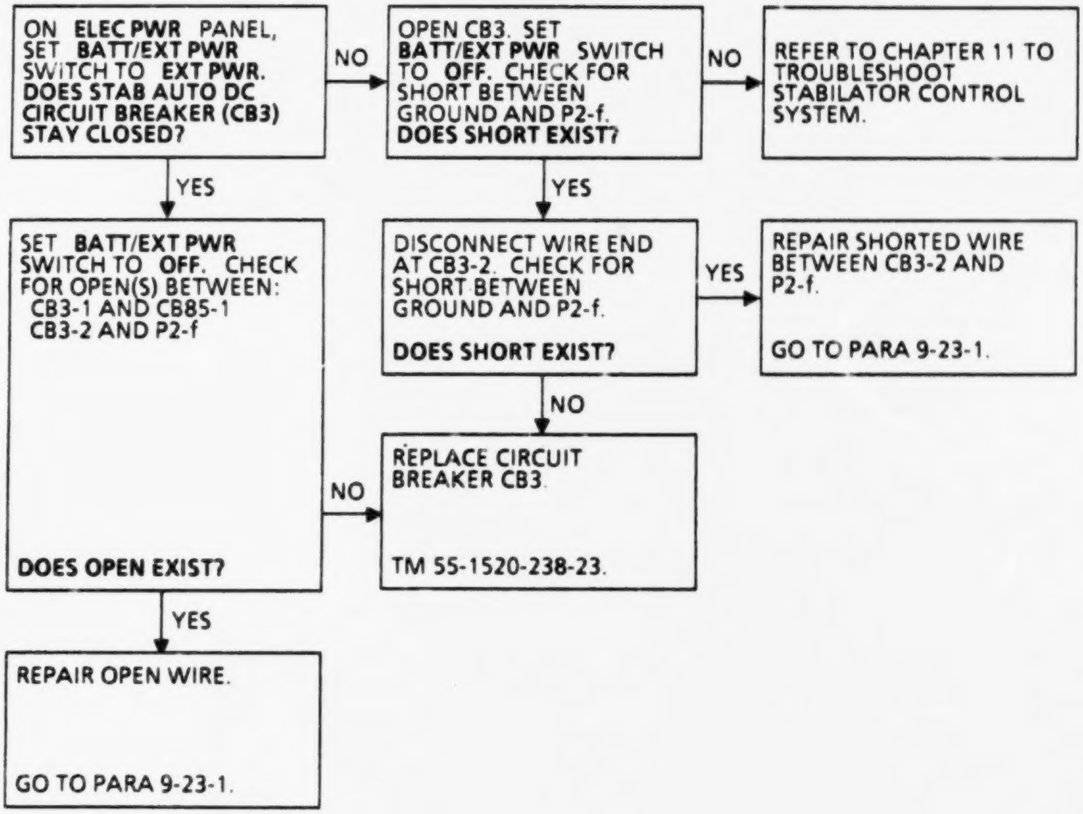
Personnel Required: (para 9-22-14)

References: (para 9-22-14)

Equipment Conditions: (para 9-22-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB AUTO DC CIRCUIT BREAKER (CB3) STAY CLOSED?
NO
OPEN CB3. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-f. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN(S) BETWEEN: CB3-1 AND CB85-1 CB3-2 AND P2-f DOES OPEN EXIST?
DISCONNECT WIRE END AT CB3-2. CHECK FOR SHORT BETWEEN GROUND AND P2-f. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB3-2 AND P2-f. GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB3. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-23-1.

END OF TASK

9-23-16

9-24-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3- CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

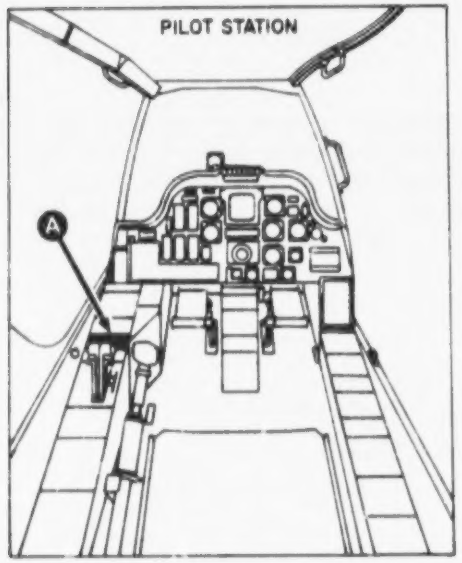
TM 55-1520-238-23

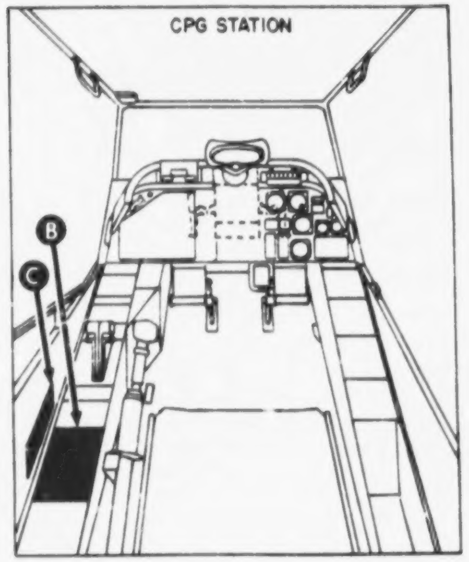
Equipment Conditions:

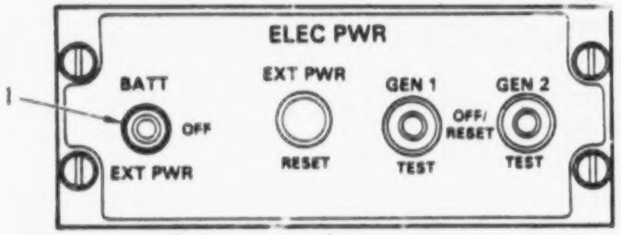
Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

WARNING

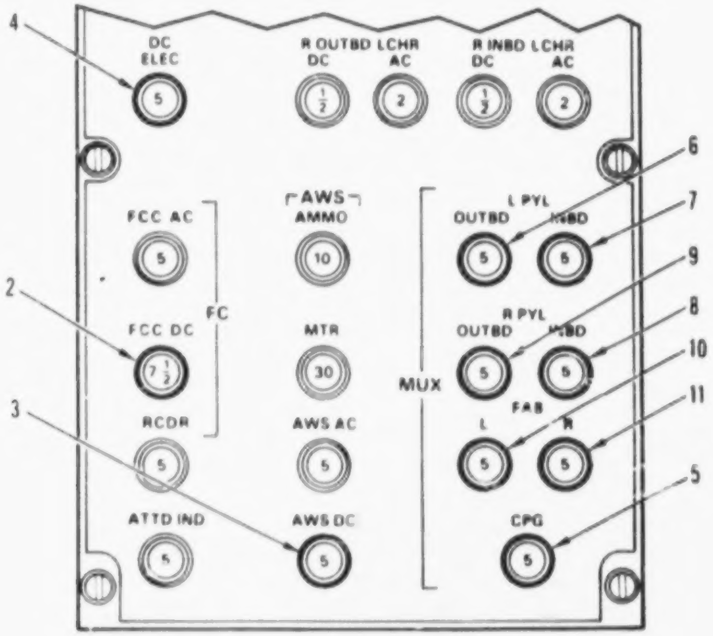
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



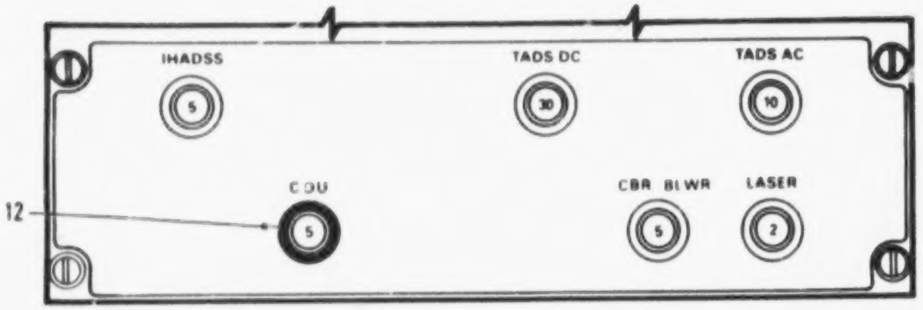




A PILOT ELEC PWR PANEL



B CPG CIRCUIT BREAKER PANEL NO.1



☛ C CPG CIRCUIT BREAKER PANEL NO.2

MM04/1-1014B

GO TO NEXT PAGE

9-24-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK (cont)

A. Perform operational as follows:

TASK	RESULT
1. On CPG circuit breaker panel No. 1, close **AWS AWS DC** (CB12) circuit breaker.	
1.1 On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
2. On CPG circuit breaker panel No. 1, check that **FC FCC DC** (CB4) (2), **AWS AWS DC** (CB12) (3), **MSL DC ELEC** (CB17) (4), **MUX CPG** (CB15) (5), **MUX L PYLON OUTBD** (CB2) (6), **MUX L PYLON IND** (CB1) (7), **MUX R PYLON INBD** (CB5) (8), **MUX R PYLON OUTBD** (CB6) (9), **MUX FAB L** (CB10) (10), and **MUX FAB R** (CB9) (11) circuit breakers stay closed.	If CB4 (2) does not stay closed, go to para 9-24-5 If CB12 (3) does not stay closed, go to para 9-24-6. If CB17 (4) does not stay closed, go to para 9-24-7. If CB15 (5) does not stay closed, go to para 9-24-8. If CB2 (6) does not stay closed, go to para 9-24-9. If CB1 (7) does not stay closed, go to para 9-24-10. If CB5 (8) does not stay closed, go to para 9-24-11. If CB6 (9) does not stay closed, go to para 9-24-12. If CB10 (10) does not stay closed, go to para 9-24-13. If CB9 (11) does not stay closed, go to para 9-24-14.
2.1 On CPG circuit breaker panel No. 2, check that **CDU** (CB6) (12) circuit breaker stays closed.	If CB6 (12) does not stay closed, go to para 9-24-15.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
4. Remove CPG circuit breaker panels No. 1 (TM 55-1520-238-23).	
5. Deleted	
6. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	

WARNING

Avoid touching circuit breaker panels to airframe, or crossing circuit breaker terminals with any tools. Failure to do so could result in death or serious injury.

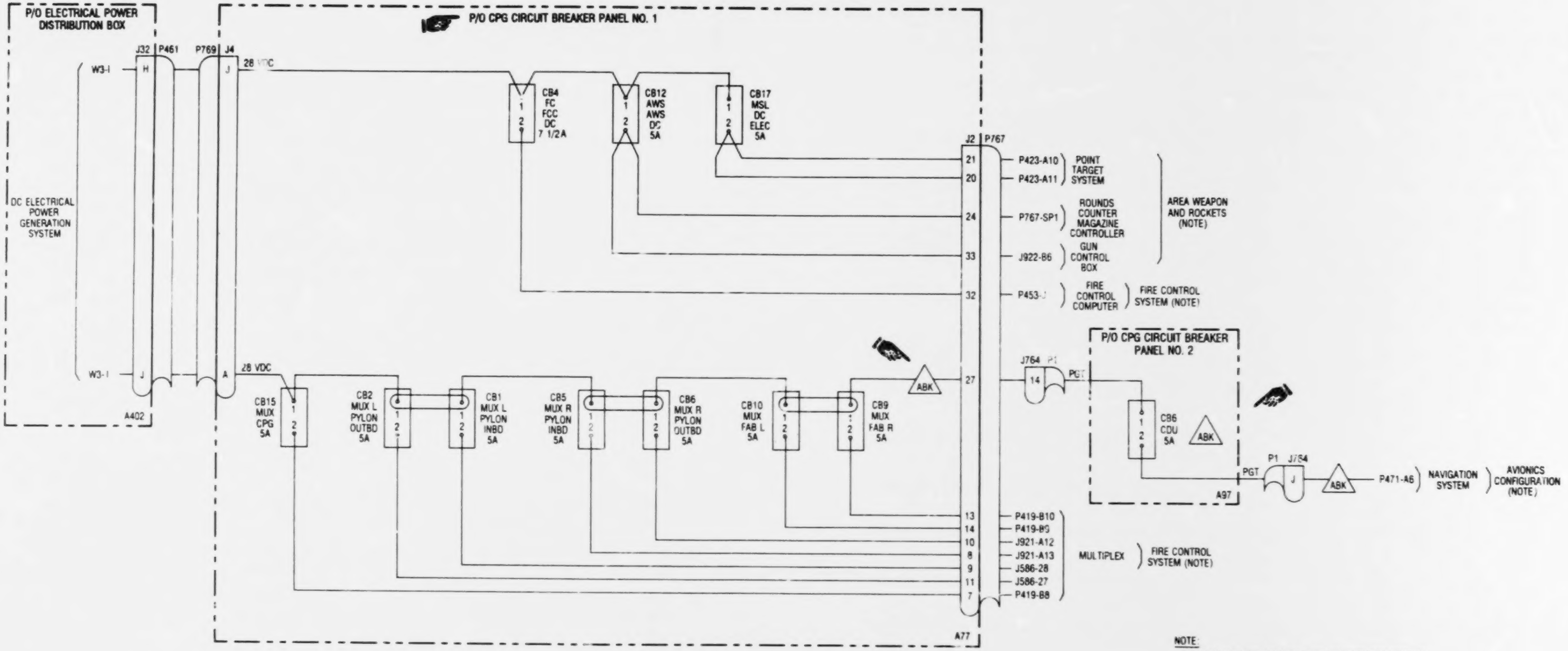
TASK	RESULT
7. Check for 28 VDC at P769-J, -A.	If 28 VDC is not present, go to para 9-24-4.
8. On ELEC PWR panel, set BATT/EXT PWR switch (1) to OFF.	
9. Check for continuity to fire control computer between J4-J and J2-32.	If continuity does not exist, go to para 9-24-5.
10. Check for continuity to gun and turret control boxes between J4-J and J2-24, -33.	If continuity does not exist, go to para 9-24-6.
11. Check for continuity to remote hellfire electronics between J4-J and J2-20, -21.	If continuity does not exist, go to para 9-24-7.
12. Check for continuity to CPG MRTU type III between J4-A and J2-7.	If continuity does not exist, go to para 9-24-8.
13. Check for continuity to pylon MRTU type II between J4-A and J2-11.	If continuity does not exist, go to para 9-24-9.
14. Check for continuity to pylon MRTU Type II between J4-A and J2-9.	If continuity does not exist, go to para 9-24-10.
15. Check for continuity to pylon MRTU type II between J4-A and J2-8.	If continuity does not exist, go to para 9-24-11.
16. Check for continuity to pylon MRTU type II between J4-A and J2-10.	If continuity does not exist, go to para 9-24-12.
17. Check for continuity to left hand FAB MRTU type I between J4-A and J2-14.	If continuity does not exist, go to para 9-24-13.
18. Check for continuity to right hand FAB MRTU type I between J4-A and J2-13.	If continuity does not exist, go to para 9-24-14.

B. Reinstall CPG circuit breaker panels No. 1 and No. 2 (TM 55-1520-238-23).

C. Remove external power application - Electrical (TM 55-1520-238-23).

END OF TASK

9-24-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION INTERCONNECTION DIAGRAM

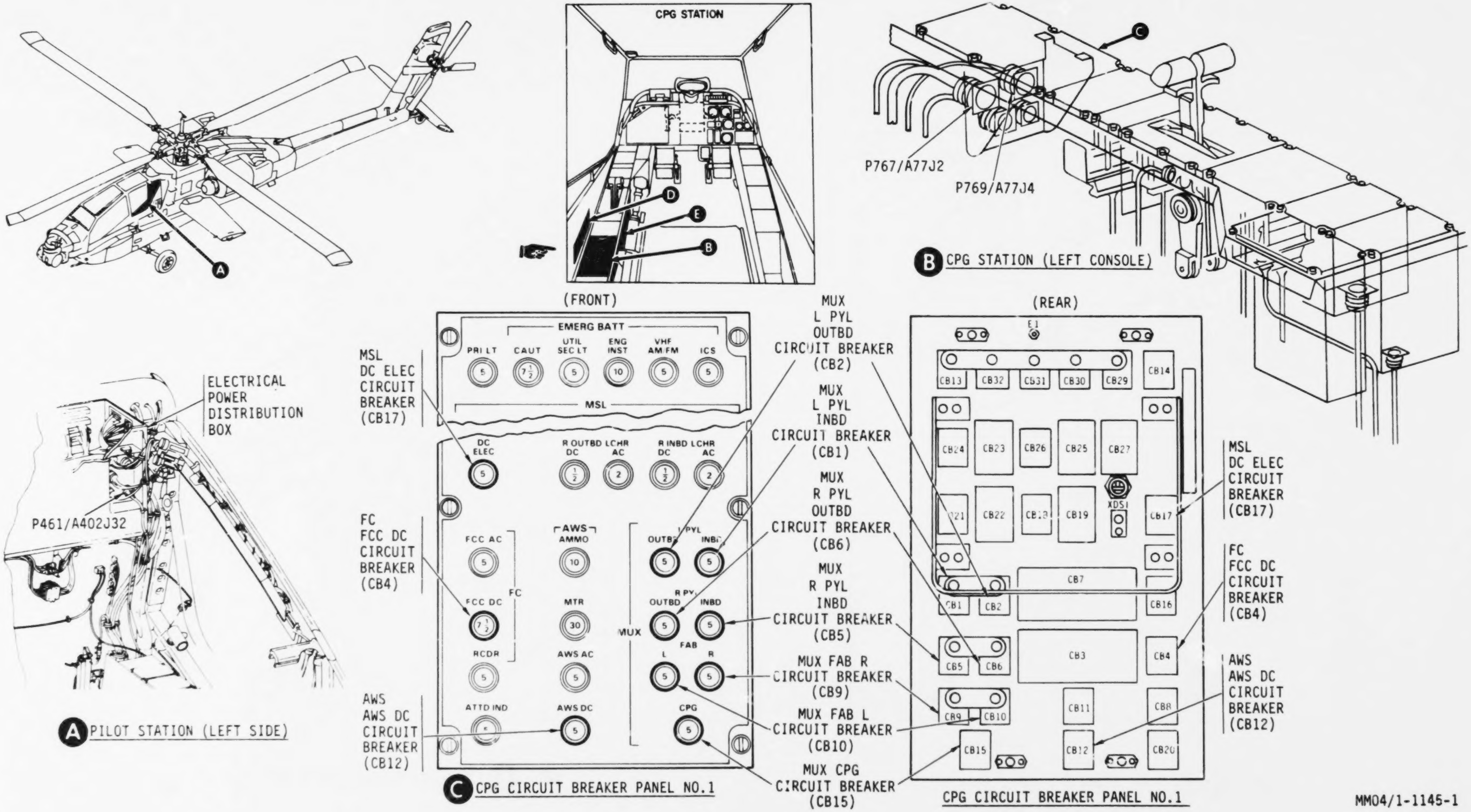


NOTE:

REFER TO CHAPTER 1 FOR SEPERATE TECHNICAL MANUAL

MM04/1-767B

9-24-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
CPG STATION
D
E
B
C
P767/A77J2
P769/A77J4
ELECTRICAL POWER DISTRIBUTION BOX
P461/A402J32
(FRONT)
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
MSL
DC ELEC
R OUTBD LCHR DC
AC
R INBD LCHR DC
AC
5
½
2
½
2
FCC AC
FCC DC
FC
RCDR
ATTD IND
AWS
AMMO
MTR
AWS AC
AWS DC
10
30
5
5
L PYL
OUTBD
INBD
R PYL
OUTBD
INBD
MUX
FAB
L
R
CPG
MSL DC ELEC CIRCUIT BREAKER (CB17)
FC FCC DC CIRCUIT BREAKER (CB4)
AWS AWS DC CIRCUIT BREAKER (CB12)
MUX L PYL OUTBD CIRCUIT BREAKER (CB2)
MUX L PYL INBD CIRCUIT BREAKER (CB1)
MUX R PYL OUTBD CIRCUIT BREAKER (CB6)
MUX R PYL INBD CIRCUIT BREAKER (CB5)
MUX FAB R CIRCUIT BREAKER (CB9)
MUX FAB L CIRCUIT BREAKER (CB10)
MUX CPG CIRCUIT BREAKER (CB15)
(REAR)
E1
CB13
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
XDS1
CB21
CB22
CB18
CB19
CB17
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
CB9
CB10
CB11
CB8
CB15
CB12
CB20
MSL DC ELEC CIRCUIT BREAKER (CB17)
FC FCC DC CIRCUIT BREAKER (CB4)
AWS AWS DC CIRCUIT BREAKER (CB12)

A PILOT STATION (LEFT SIDE)

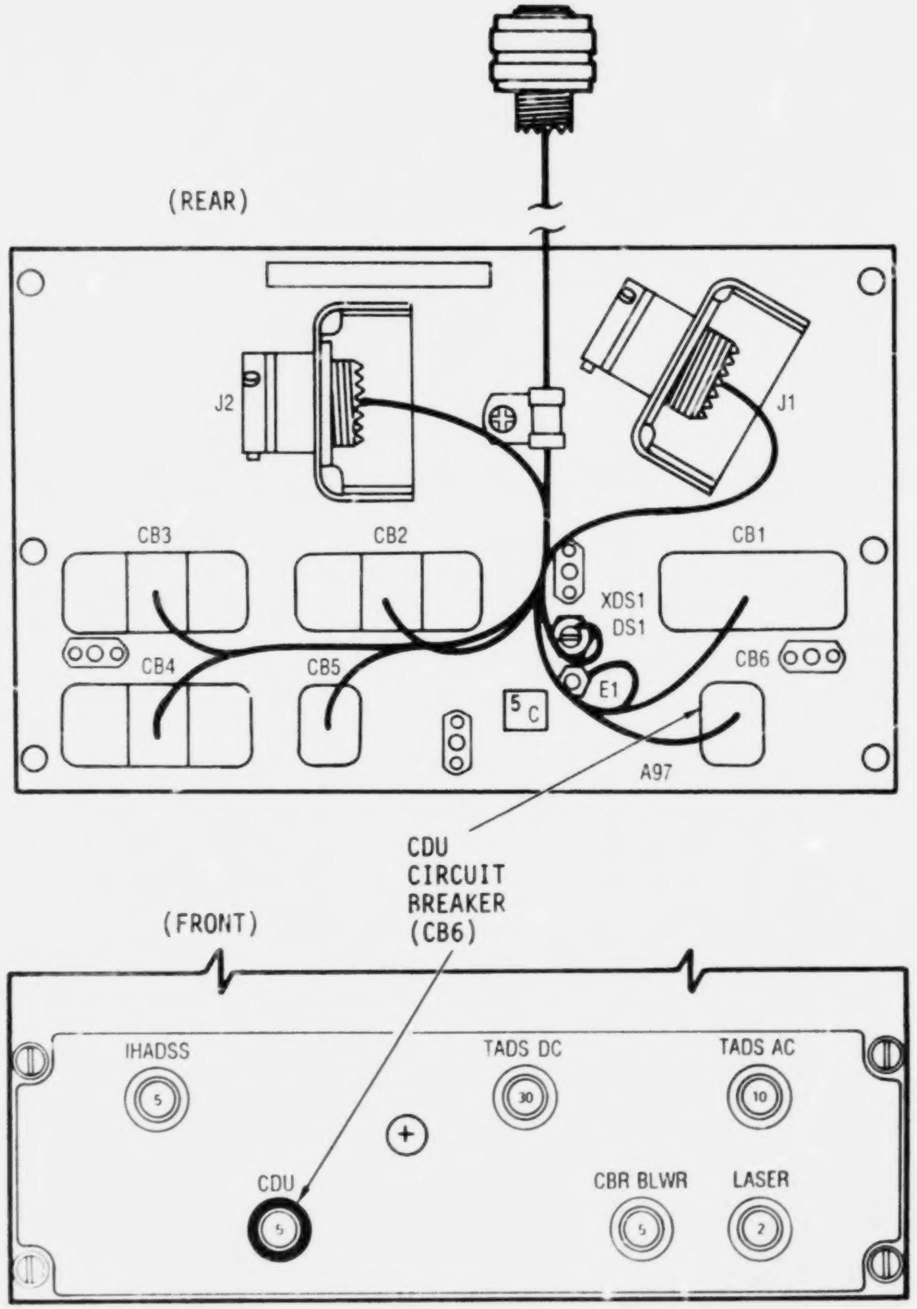
B CPG STATION (LEFT CONSOLE)

C CPG CIRCUIT BREAKER PANEL NO.1

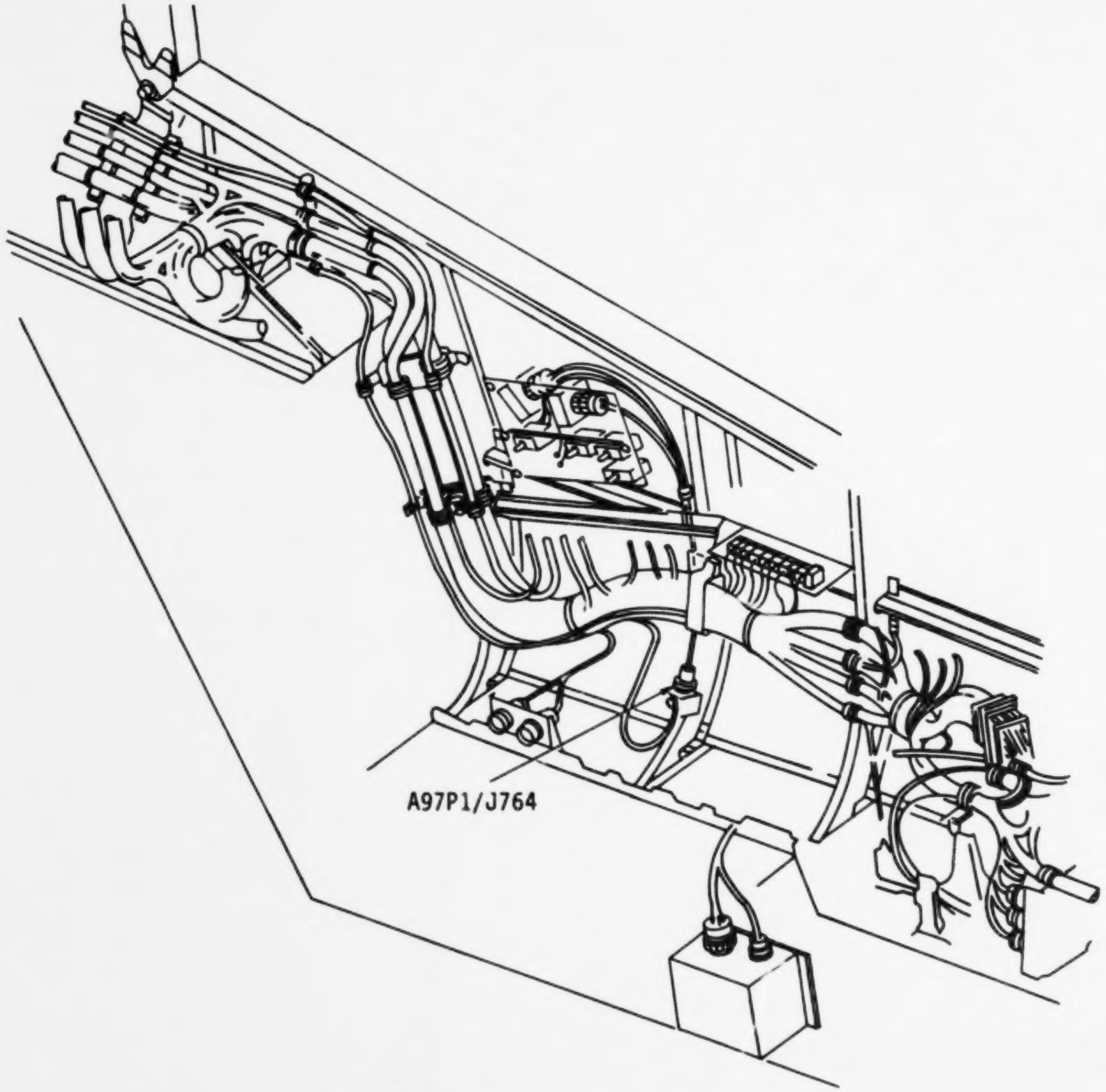
CPG CIRCUIT BREAKER PANEL NO.1

MM04/1-1145-1

9-24-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



☞ D CPG CIRCUIT BREAKER PANEL NO.2



☞ E CPG STATION (BELOW LEFT CONSOLE)

MM04/1-1145-2A

9-23-16. STAB AUTO DC CIRCUIT BREAKER (CB3) - DOES NOT STAY CLOSED OR 28 VDC TO STABILATOR CONTROL UNIT IS NOT PRESENT AT P2-f

Tools: (para 9-22-14)

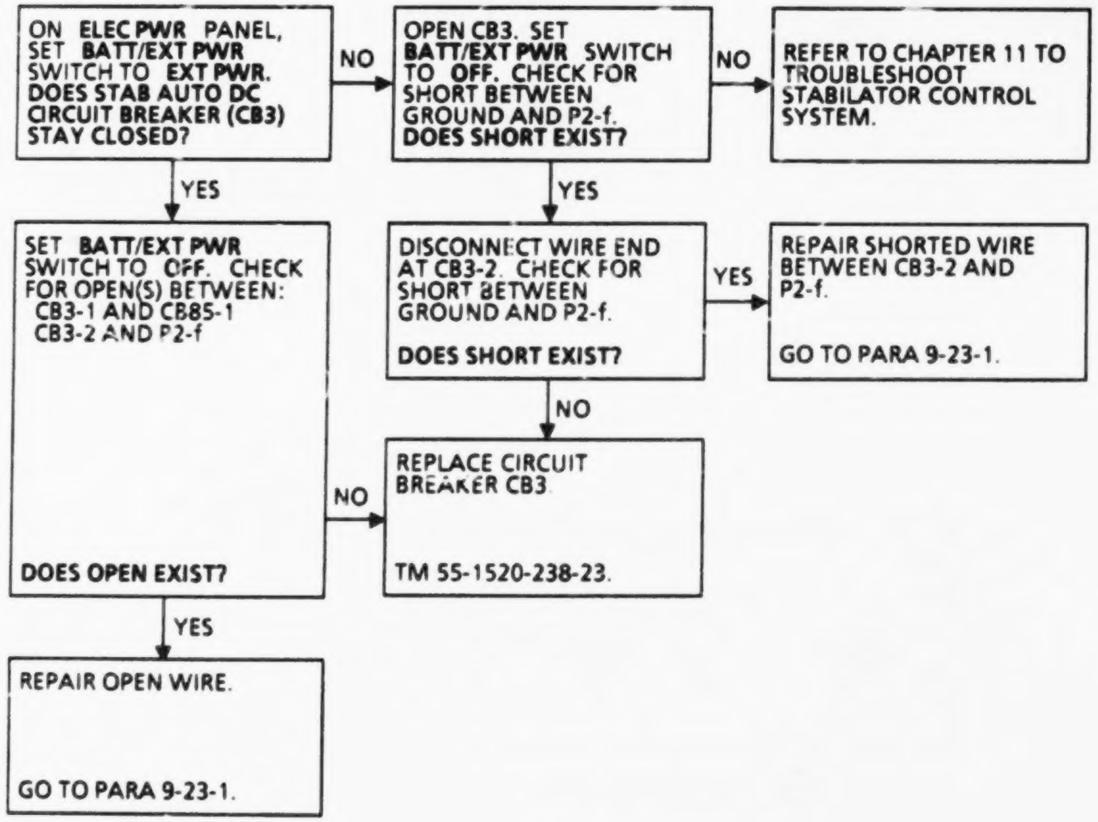
Personnel Required: (para 9-22-14)

References: (para 9-22-14)

Equipment Conditions: (para 9-22-14)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES STAB AUTO DC CIRCUIT BREAKER (CB3) STAY CLOSED?
NO
OPEN CB3. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND P2-f. DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR CONTROL SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN(S) BETWEEN: CB3-1 AND CB85-1 CB3-2 AND P2-f
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB3-2. CHECK FOR SHORT BETWEEN GROUND AND P2-f.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB3-2 AND P2-f.
GO TO PARA 9-23-1.
NO
NO
REPLACE CIRCUIT BREAKER CB3
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-23-1.

END OF TASK

9-24-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

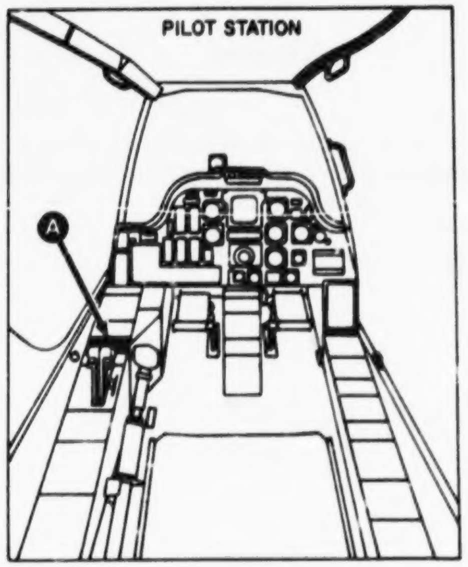
TM 55-1520-238-23

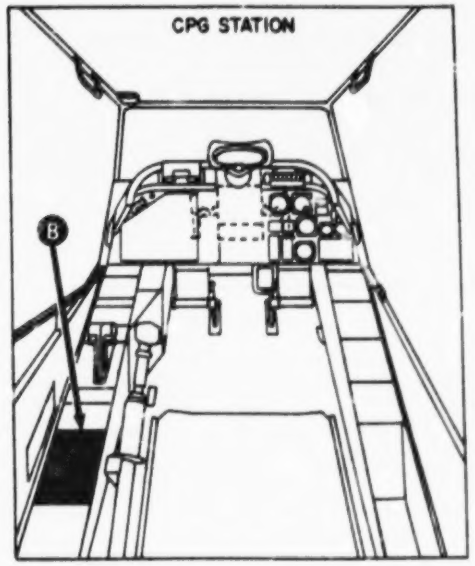
Equipment Conditions:

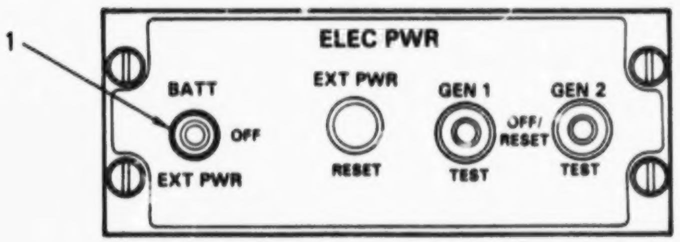
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

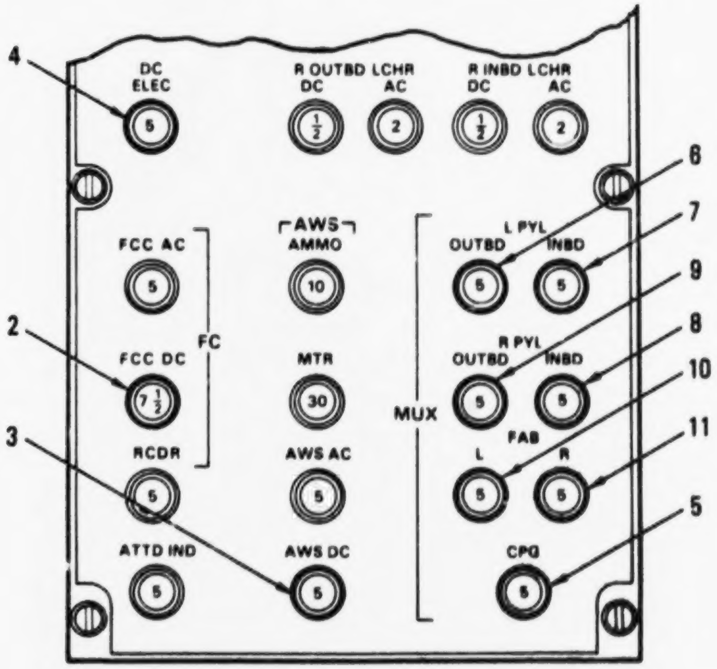
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.







A PILOT ELEC PWR PANEL



B CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1014A

GO TO NEXT PAGE

9-24-1. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - OPERATIONAL CHECK (cont)

A. Perform operational as follows:

TASK	RESULT
1. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
2. On CPG circuit breaker panel No. 1, check that the **FC FCC DC** (CB4) (2), **AWS AWS DC** (CB12) (3), **MSL DC ELEC** (CB17) (4), **MUX CPG** (CB15) (5), **MUX L PYLON OUTBD** (CB2) (6), **MUX L PYLON IND** (CB1) (7), **MUX R PYLON INBD** (CB5) (8), **MUX R PYLON OUTBD** (CB6) (9), **MUX FAB L** (CB10) (10), and **MUX FAB R** (CB9) (11) circuit breakers are closed.	If CB4 (2) does not stay closed, go to para 9-24-5 If CB12 (3) does not stay closed, go to para 9-24-6. If CB17 (4) does not stay closed, go to para 9-24-7. If CB15 (5) does not stay closed, go to para 9-24-8. If CB2 (6) does not stay closed, go to para 9-24-9. If CB1 (7) does not stay closed, go to para 9-24-10. If CB5 (8) does not stay closed, go to para 9-24-11. If CB6 (9) does not stay closed, go to para 9-24-12. CB10 (10) does not stay closed, go to para 9-24-13. If CB9 (11) does not stay closed, go to para 9-24-14.
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF.**	
4. Remove CPG circuit breaker panel No. 1 (TM 55-1520-238-23).	
5. Disconnect J767 and J769.	
6. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**	
7. Check for 28 VDC at J769-J, -A.	If 28 VDC is not present, go to para 9-24-4.
8. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF.**	
9. Check for continuity to fire control computer between J4-J and J2-32.	If continuity does not exist, go to para 9-24-5.
10. Check for continuity to gun and turret control boxes between J4-J and J2-24, -33.	If continuity does not exist, go to para 9-24-6.
11. Check for continuity to remote hellfire electronics between J4-J and J2-20, -21.	If continuity does not exist, go to para 9-24-7.
12. Check for continuity to CPG MRTU type III between J4-A and J2-7.	If continuity does not exist, go to para 9-24-8.
13. Check for continuity to pylon MRTU type II between J4-A and J2-11.	If continuity does not exist, go to para 9-24-9.
14. Check for continuity to pylon MRTU Type II between J4-A and J2-9.	If continuity does not exist, go to para 9-24-10.
15. Check for continuity to pylon MRTU type II between J4-A and J2-8.	If continuity does not exist, go to para 9-24-11.
16. Check for continuity to pylon MRTU type II between J4-A and J2-10.	If continuity does not exist, go to para 9-24-12.
17. Check for continuity to left hand FAB MRTU type I between J4-A and J2-14.	If continuity does not exist, go to para 9-24-13.
18. Check for continuity to right hand FAB MRTU type I between J4-A and J2-13.	If continuity does not exist, go to para 9-24-14.

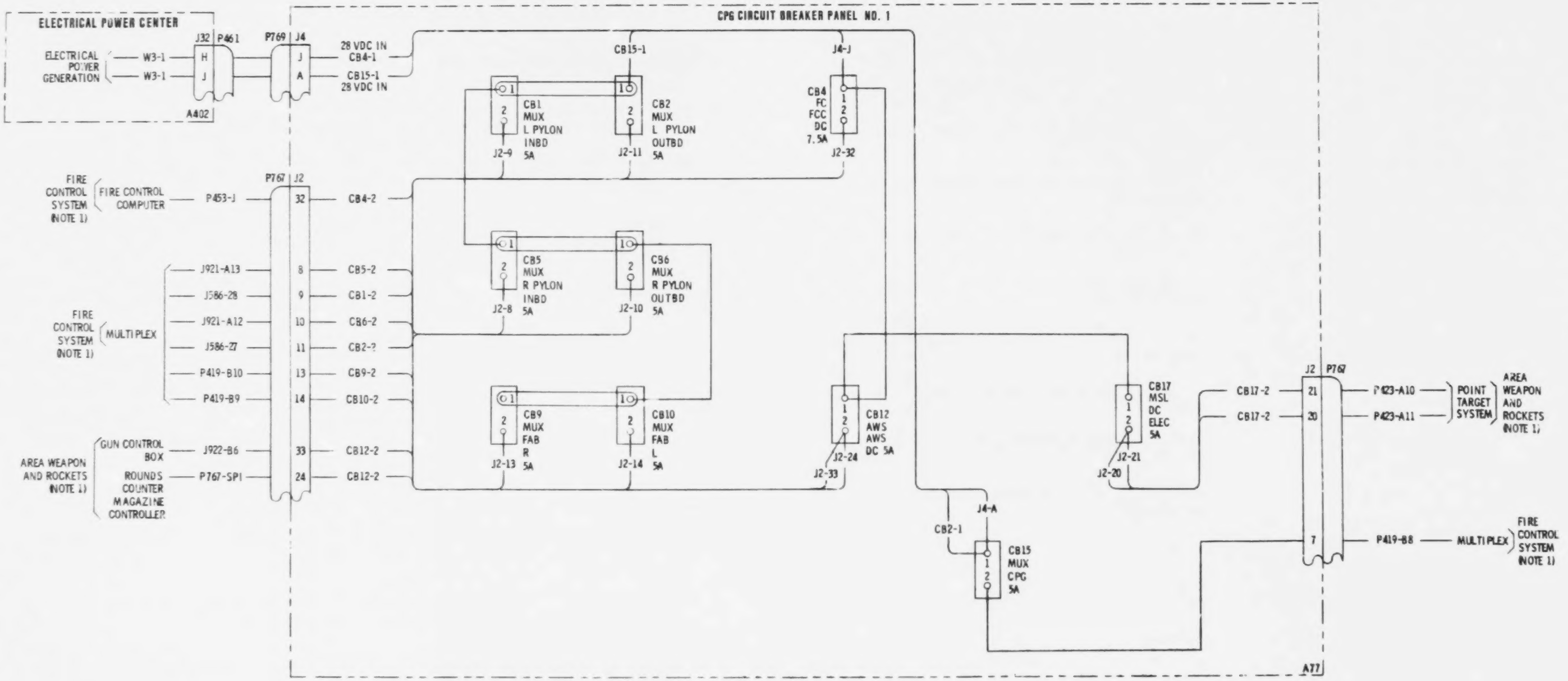
B. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).

C. Reconnect J767 and J769.

D. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-24-2. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - INTERCONNECTION DIAGRAM

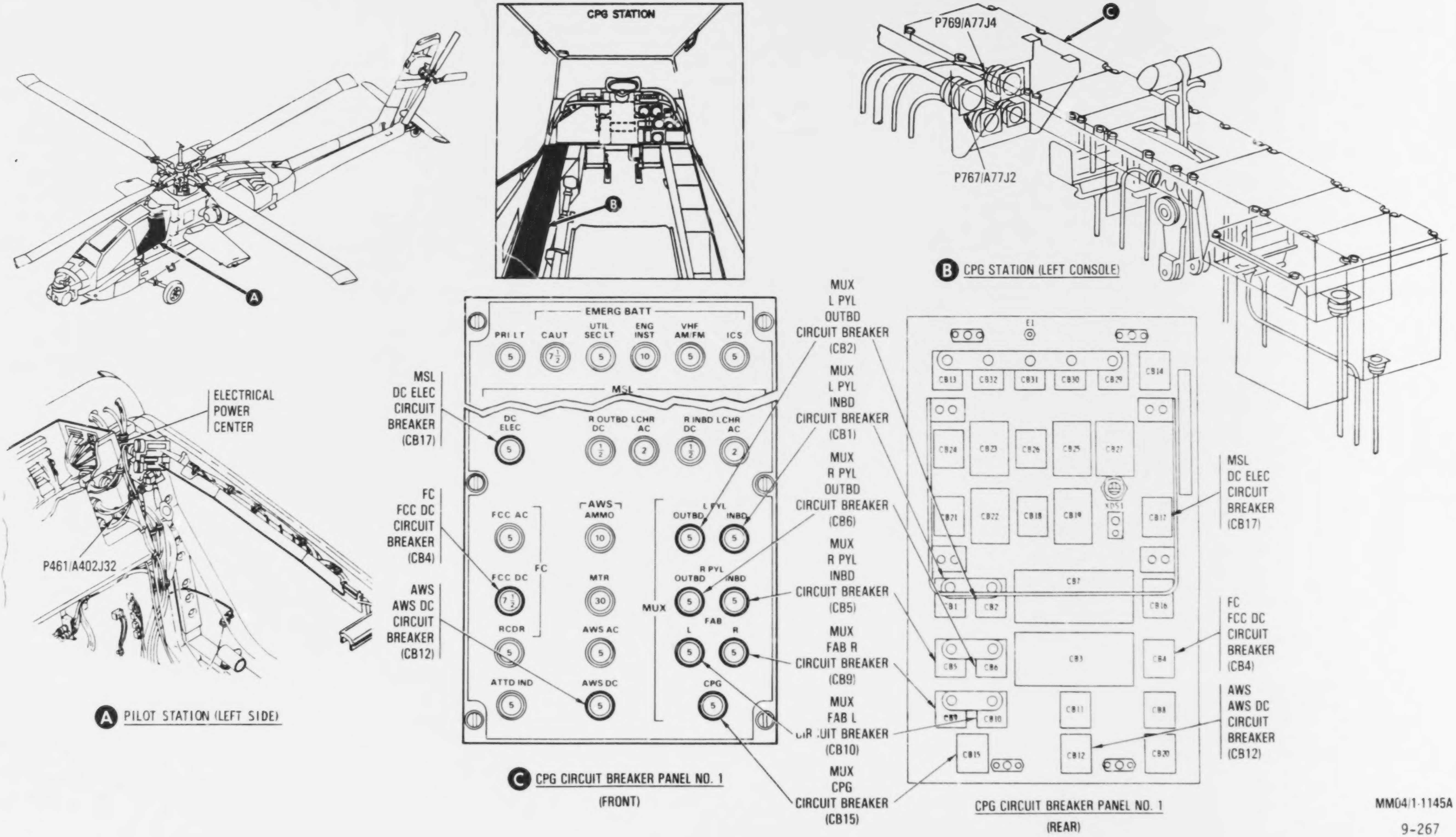


NOTE.

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-767A

9-24-3. CIRCUIT PROTECTION SYSTEM (DC ESSENTIAL BUS 3 - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION


A
ELECTRICAL POWER CENTER
P461/A402J32
CPG STATION
B
C
P769/A77J4
P767/A77J2
EMERG BATT
PRI LT
CAUT
UTIL SEC LT
ENG INST
VHF AM/FM
ICS
5
7½
5
10
5
5
MSL
DC ELEC
R OUTBD DC
LCHR AC
R INBD DC
LCHR AC
5
½
2
½
2
FCC AC
5
FC
FCC DC
7½
RCDR
5
ATTD IND
5
AWS
AMMO
10
MTR
30
AWS AC
5
AWS DC
5
MUX
L PYL
OUTBD
INBD
5
5
R PYL
OUTBD
INBD
5
5
FAB
L
R
5
5
CPG
5
MSL DC ELEC CIRCUIT BREAKER (CB17)
FC FCC DC CIRCUIT BREAKER (CB4)
AWS AWS DC CIRCUIT BREAKER (CB12)
MUX L PYL OUTBD CIRCUIT BREAKER (CB2)
MUX L PYL INBD CIRCUIT BREAKER (CB1)
MUX R PYL OUTBD CIRCUIT BREAKER (CB6)
MUX R PYL INBD CIRCUIT BREAKER (CB5)
MUX FAB R CIRCUIT BREAKER (CB9)
MUX FAB L CIRCUIT BREAKER (CB10)
MUX CPG CIRCUIT BREAKER (CB15)
E1
CB13
CB32
CB31
CB30
CB29
CB14
CB24
CB23
CB26
CB25
CB27
CB21
CB22
CB18
CB19
XDS1
CB17
CB7
CB1
CB2
CB16
CB5
CB6
CB3
CB4
CB9
CB10
CB11
CB8
CB15
CB12
CB20
MSL DC ELEC CIRCUIT BREAKER (CB17)
FC FCC DC CIRCUIT BREAKER (CB4)
AWS AWS DC CIRCUIT BREAKER (CB12)

Ⓐ PILOT STATION (LEFT SIDE)

Ⓑ CPG STATION (LEFT CONSOLE)

Ⓒ CPG CIRCUIT BREAKER PANEL NO. 1
(FRONT)

CPG CIRCUIT BREAKER PANEL NO. 1
(REAR)

MM04/1-1145A

9-24-4. 28 VDC - IS NOT PRESENT AT P769-A, -J

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

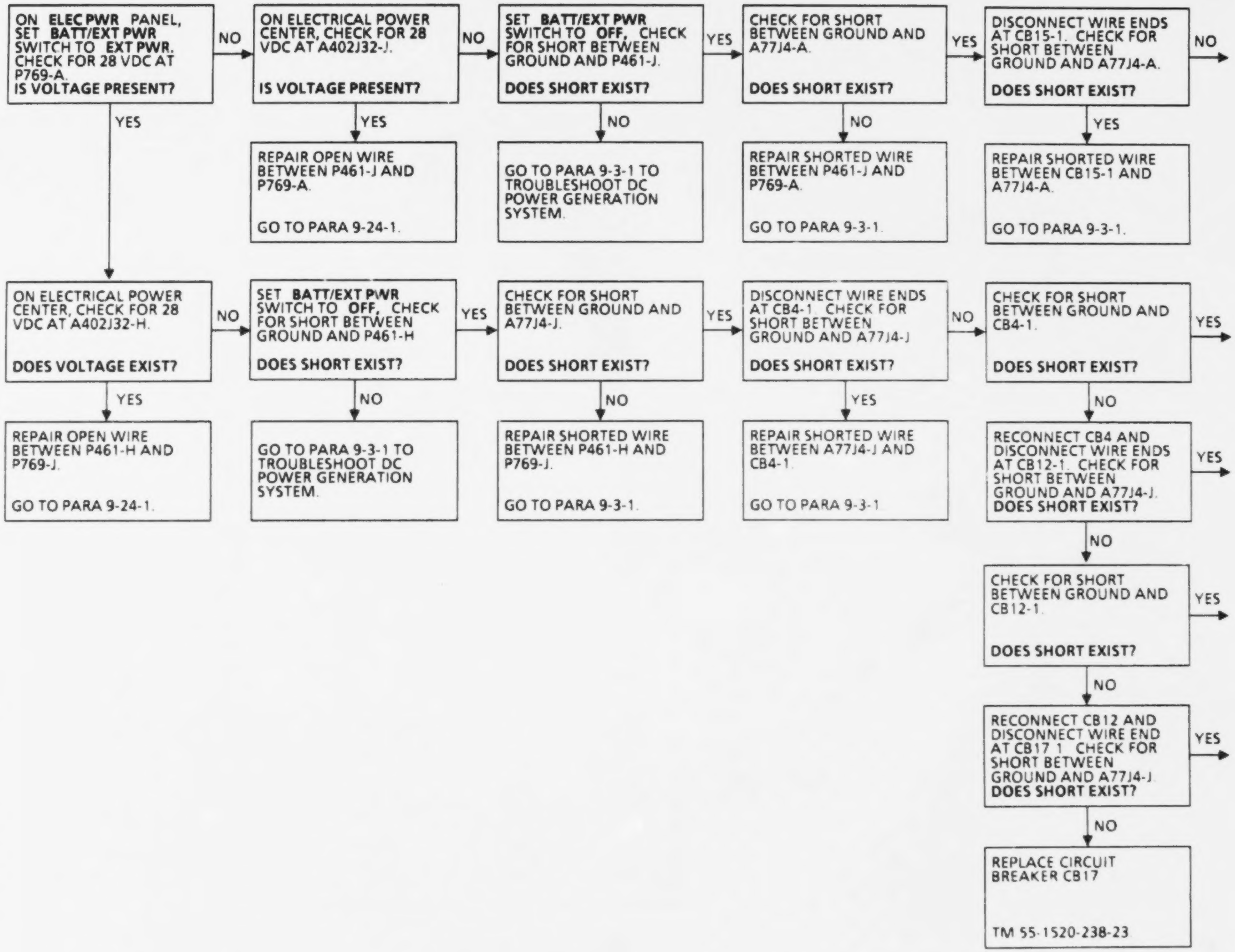
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed
Para 9-22-1	ALL DC essential bus 2 - pilot station circuit breakers open

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** CHECK FOR 28 VDC AT P769-A. **IS VOLTAGE PRESENT?**

NO: ON ELECTRICAL POWER CENTER, CHECK FOR 28 VDC AT A402J32-J. **IS VOLTAGE PRESENT?**

YES: REPAIR OPEN WIRE BETWEEN P461-J AND P769-A. GO TO PARA 9-24-1.

NO: SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR SHORT BETWEEN GROUND AND P461-J. **DOES SHORT EXIST?**

NO: GO TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

YES: CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. **DOES SHORT EXIST?**

NO: REPAIR SHORTED WIRE BETWEEN P461-J AND P769-A. GO TO PARA 9-3-1.

YES: DISCONNECT WIRE ENDS AT CB15-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. **DOES SHORT EXIST?**

YES: REPAIR SHORTED WIRE BETWEEN CB15-1 AND A77J4-A. GO TO PARA 9-3-1.

NO: →

YES: ON ELECTRICAL POWER CENTER, CHECK FOR 28 VDC AT A402J32-H. **DOES VOLTAGE EXIST?**

YES: REPAIR OPEN WIRE BETWEEN P461-H AND P769-J. GO TO PARA 9-24-1.

NO: SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR SHORT BETWEEN GROUND AND P461-H. **DOES SHORT EXIST?**

NO: GO TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION SYSTEM.

YES: CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. **DOES SHORT EXIST?**

NO: REPAIR SHORTED WIRE BETWEEN P461-H AND P769-J. GO TO PARA 9-3-1.

YES: DISCONNECT WIRE ENDS AT CB4-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. **DOES SHORT EXIST?**

YES: REPAIR SHORTED WIRE BETWEEN A77J4-J AND CB4-1. GO TO PARA 9-3-1.

NO: CHECK FOR SHORT BETWEEN GROUND AND CB4-1. **DOES SHORT EXIST?**

YES: →

NO: RECONNECT CB4 AND DISCONNECT WIRE ENDS AT CB12-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. **DOES SHORT EXIST?**

YES: →

NO: CHECK FOR SHORT BETWEEN GROUND AND CB12-1. **DOES SHORT EXIST?**

YES: →

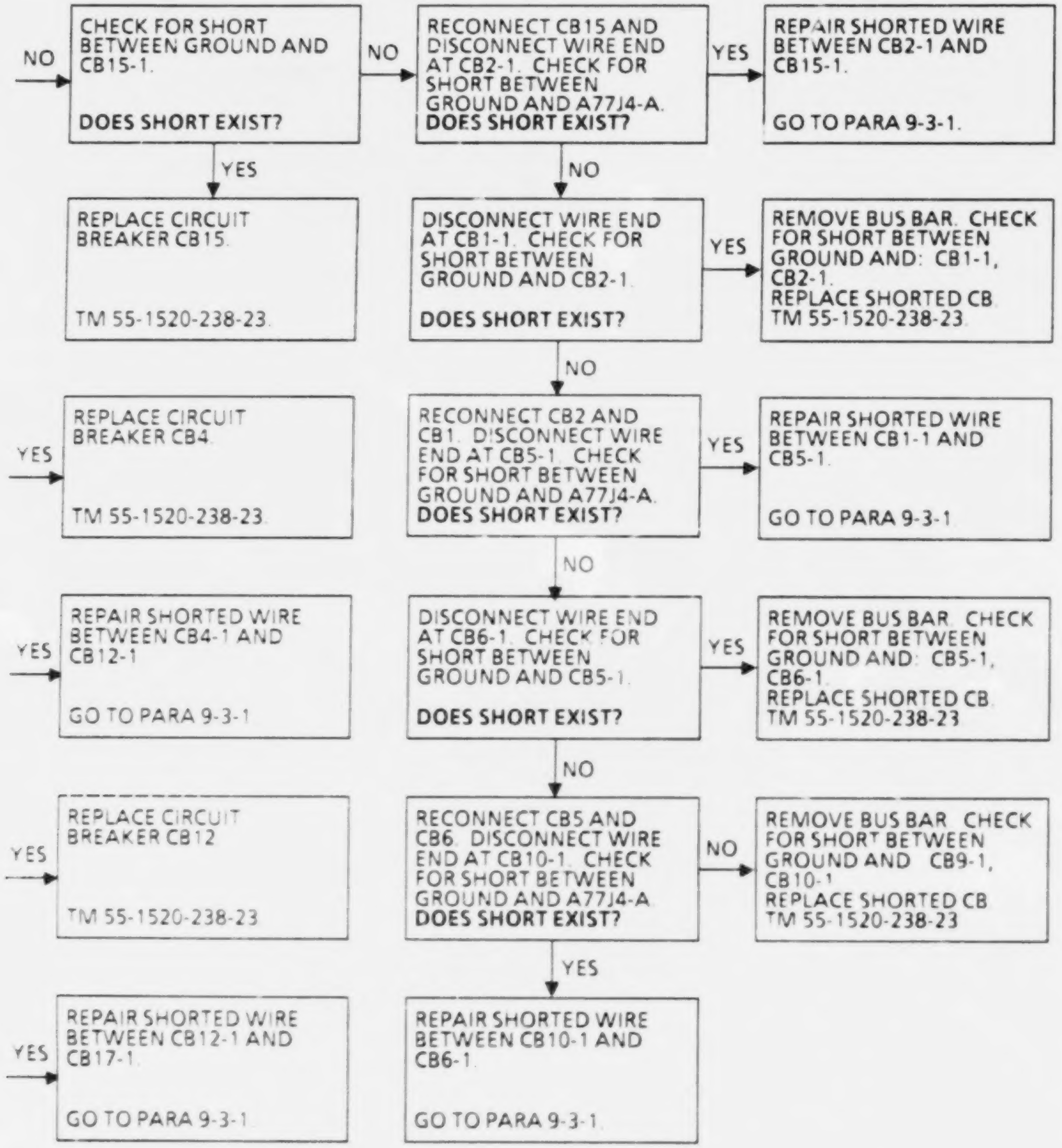
NO: RECONNECT CB12 AND DISCONNECT WIRE END AT CB17 1 CHECK FOR SHORT BETWEEN GROUND AND A77J4-J. **DOES SHORT EXIST?**

YES: →

NO: REPLACE CIRCUIT BREAKER CB17. TM 55-1520-238-23

GO TO NEXT PAGE

9-24-4. 28 VDC - IS NOT PRESENT AT P769-A, -J (cont)


NO
CHECK FOR SHORT BETWEEN GROUND AND CB15-1. DOES SHORT EXIST?
NO
RECONNECT CB15 AND DISCONNECT WIRE END AT CB2-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB2-1 AND CB15-1. GO TO PARA 9-3-1.
YES
REPLACE CIRCUIT BREAKER CB15. TM 55-1520-238-23.
NO
DISCONNECT WIRE END AT CB1-1. CHECK FOR SHORT BETWEEN GROUND AND CB2-1. DOES SHORT EXIST?
YES
REMOVE BUS BAR. CHECK FOR SHORT BETWEEN GROUND AND: CB1-1, CB2-1. REPLACE SHORTED CB TM 55-1520-238-23.
YES
REPLACE CIRCUIT BREAKER CB4. TM 55-1520-238-23.
NO
RECONNECT CB2 AND CB1. DISCONNECT WIRE END AT CB5-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB1-1 AND CB5-1. GO TO PARA 9-3-1.
YES
REPAIR SHORTED WIRE BETWEEN CB4-1 AND CB12-1. GO TO PARA 9-3-1.
NO
DISCONNECT WIRE END AT CB6-1. CHECK FOR SHORT BETWEEN GROUND AND CB5-1. DOES SHORT EXIST?
YES
REMOVE BUS BAR. CHECK FOR SHORT BETWEEN GROUND AND: CB5-1, CB6-1. REPLACE SHORTED CB. TM 55-1520-238-23
YES
REPLACE CIRCUIT BREAKER CB12. TM 55-1520-238-23
NO
RECONNECT CB5 AND CB6. DISCONNECT WIRE END AT CB10-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-A. DOES SHORT EXIST?
NO
REMOVE BUS BAR. CHECK FOR SHORT BETWEEN GROUND AND CB9-1, CB10-1. REPLACE SHORTED CB TM 55-1520-238-23
YES
REPAIR SHORTED WIRE BETWEEN CB12-1 AND CB17-1. GO TO PARA 9-3-1
YES
REPAIR SHORTED WIRE BETWEEN CB10-1 AND CB6-1. GO TO PARA 9-3-1.

END OF TASK

9-24-5. FC FCC DC CIRCUIT BREAKER (CB4) - DOES NOT STAY CLOSED OR CONTINUITY TO FIRE CONTROL COMPUTER DOES NOT EXIST BETWEEN J4-J AND J2032

Tools: (para 9-24-4)

Personnel Required: (para 9-24-4)

References:

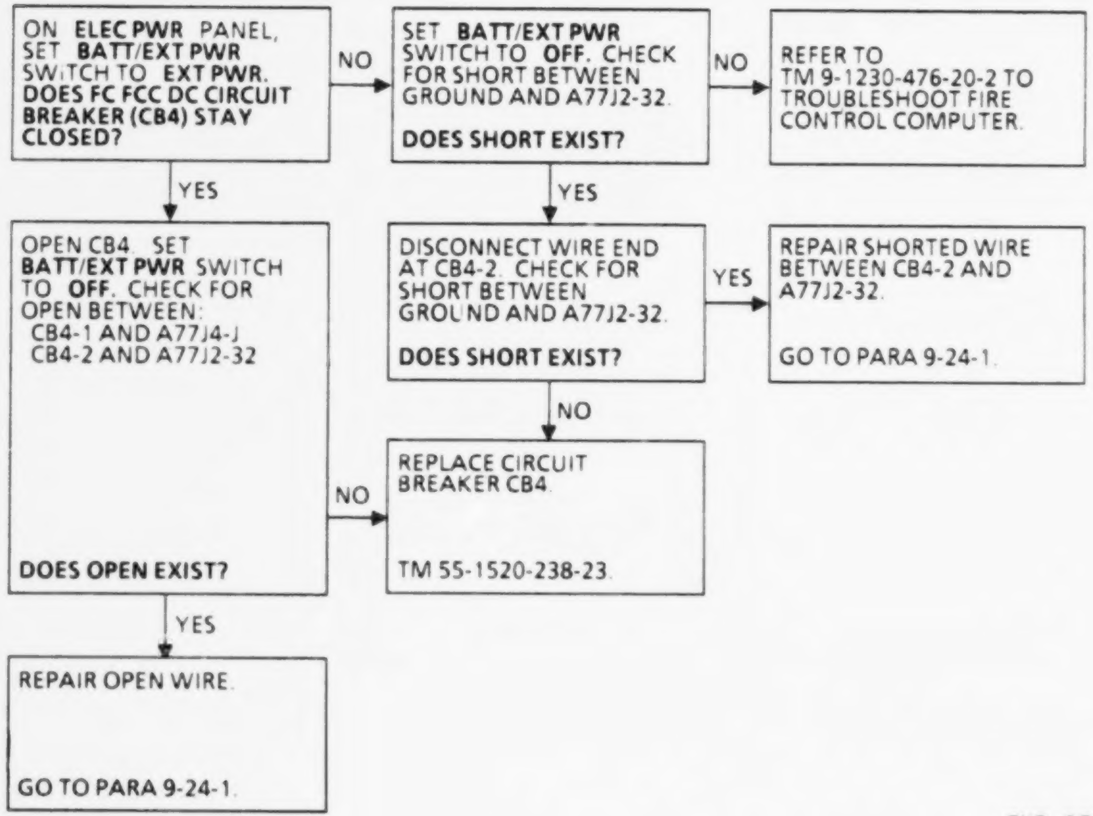
TM 55-1520-238-23
TM 9-1090-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FC FCC DC CIRCUIT BREAKER (CB4) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-32. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT FIRE CONTROL COMPUTER.
YES
OPEN CB4. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB4-1 AND A77J4-J CB4-2 AND A77J2-32 DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB4-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-32. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB4-2 AND A77J2-32. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB4. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-6. AWS AWS DC CIRCUIT BREAKER (CB12) - DOES NOT STAY CLOSED OR CONTINUITY TO GUN AND TURRET CONTROL BOXES DOES NOT EXIST BETWEEN J4-J AND J2-24, -33

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	1580-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

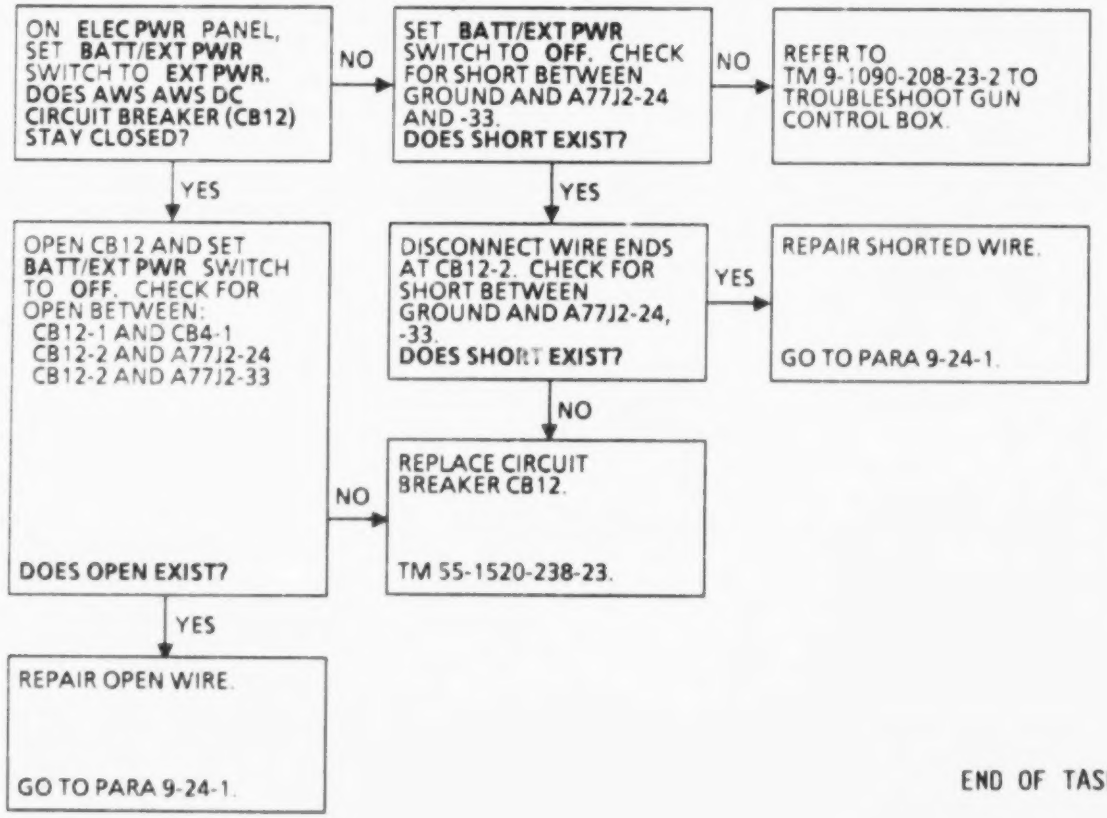
TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panels lowered
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES AWS AWS DC CIRCUIT BREAKER (CB12) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-24 AND -33. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT GUN CONTROL BOX.
YES
YES
OPEN CB12 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB12-1 AND CB4-1
CB12-2 AND A77J2-24
CB12-2 AND A77J2-33
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB12-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-24, -33. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB12. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-7. MSL DC CIRCUIT BREAKER (CB17) - DOES NOT STAY CLOSED OR CONTINUITY TO REMOTE HELLFIRE ELECTRONICS UNIT DOES NOT EXIST BETWEEN J4-J AND J2-20, -21

Tools: (para 9-24-6)

Personnel Required: (para 9-24-6)

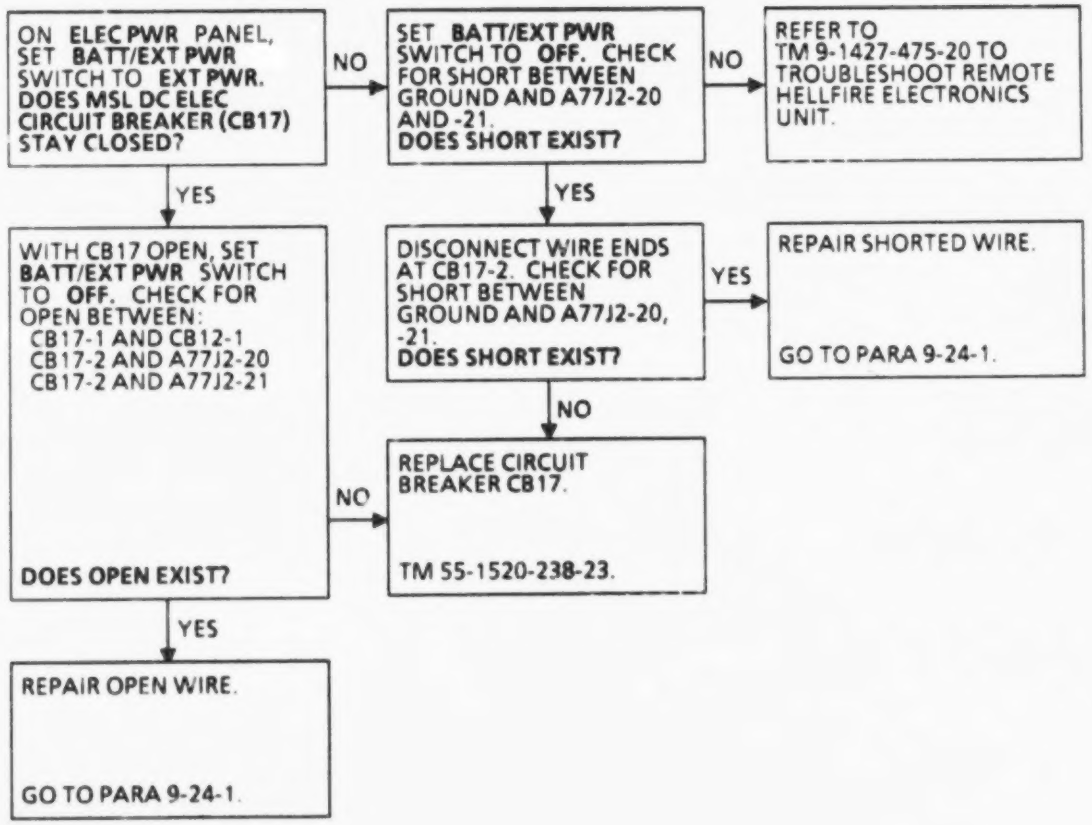
References:

TM 55-1520-238-23
TM 9-1427-475-20

Equipment Conditions: (para 9-24-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MSL DC ELEC CIRCUIT BREAKER (CB17) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-20 AND -21. DOES SHORT EXIST?
NO
REFER TO TM 9-1427-475-20 TO TROUBLESHOOT REMOTE HELLFIRE ELECTRONICS UNIT.
YES
YES
WITH CB17 OPEN, SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB17-1 AND CB12-1
CB17-2 AND A77J2-20
CB17-2 AND A77J2-21
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB17-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-20, -21. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB17. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

END OF TASK

9-24-8. MUX CPG CIRCUIT BREAKER (CB15) - DOES NOT STAY CLOSED OR CONTINUITY TO CPG MRTU TYPE III DOES NOT EXIST BETWEEN J4-A AND J2-7

Tools: (para 9-24-6)

Personnel Required: (para 9-24-6)

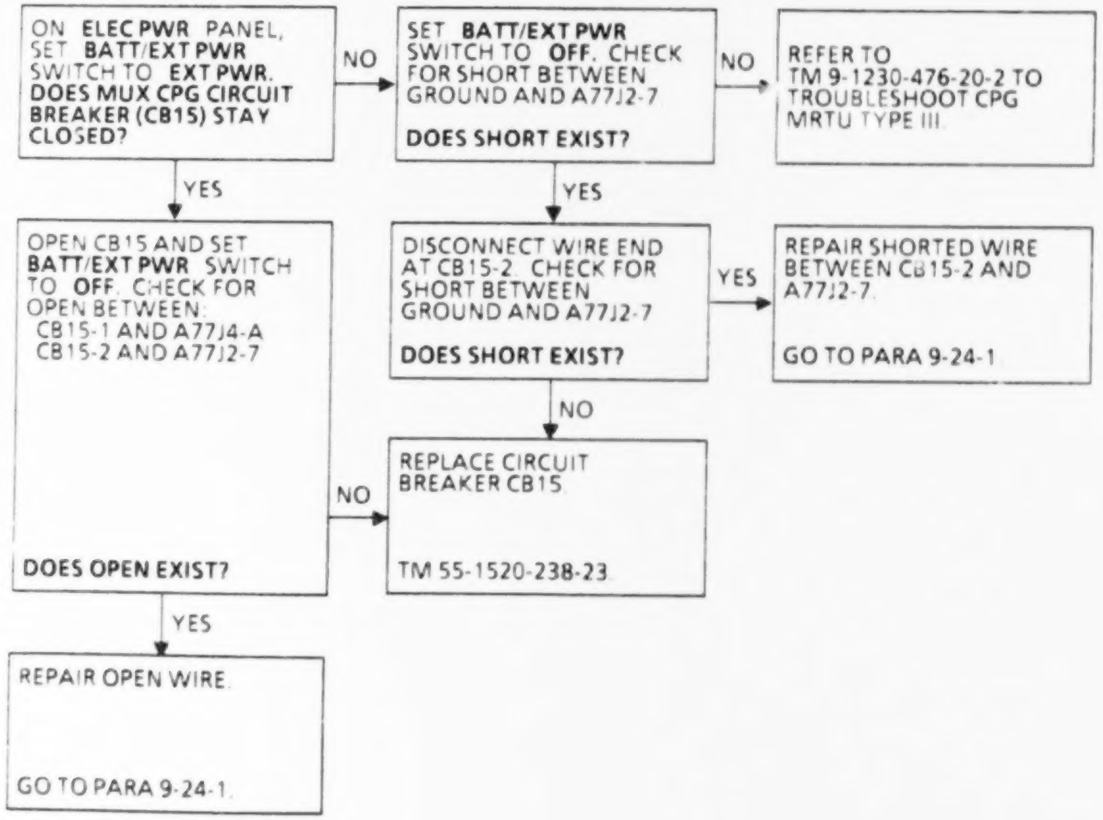
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions: (para 9-24-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX CPG CIRCUIT BREAKER (CB15) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-7
DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT CPG MRTU TYPE III.
YES
YES
OPEN CB15 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB15-1 AND A77J4-A
CB15-2 AND A77J2-7
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB15-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-7
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB15-2 AND A77J2-7.
GO TO PARA 9-24-1
NO
NO
REPLACE CIRCUIT BREAKER CB15.
TM 55-1520-238-23
YES
REPAIR OPEN WIRE.
GO TO PARA 9-24-1.

END OF TASK

9-24-9. MUX L PYL OUTBD CIRCUIT BREAKER (CB2) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-11

Tools: (para 9-24-6)

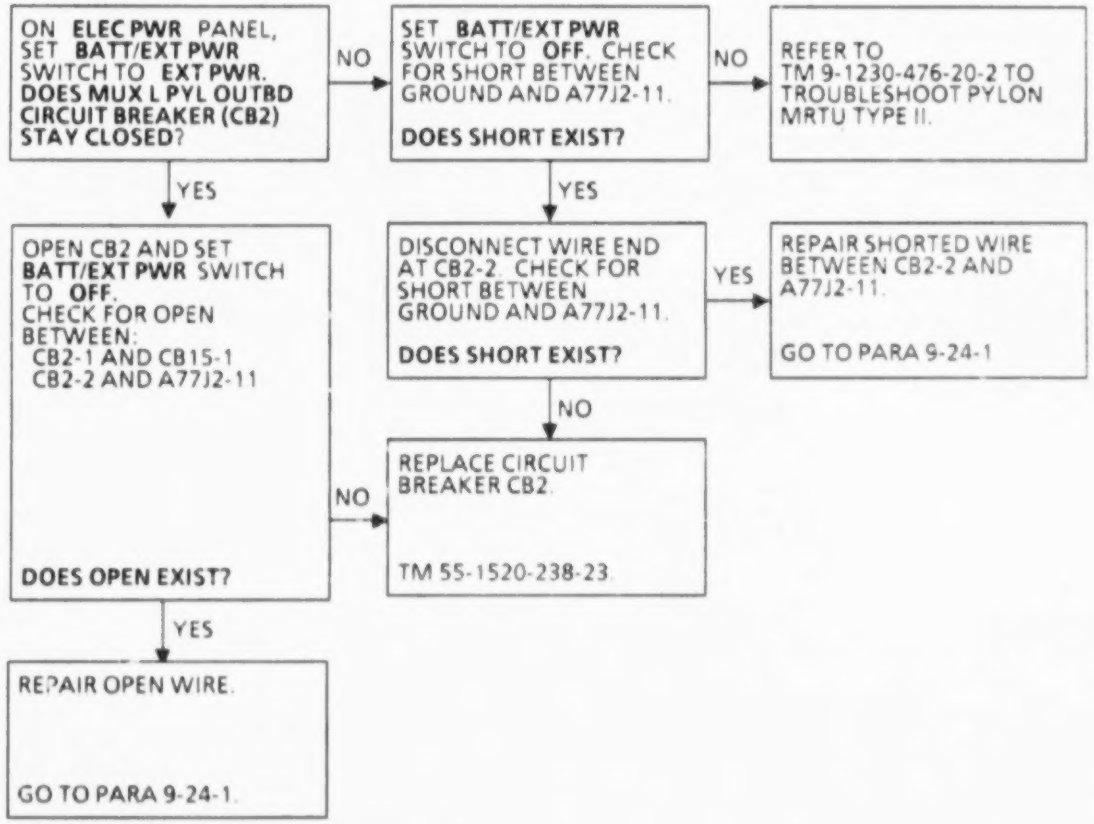
Personnel Required: (para 9-24-6)

References: (para 9-24-8)

Equipment Conditions: (para 9-24-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX L PYL OUTBD CIRCUIT BREAKER (CB2) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-11.
DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
YES
OPEN CB2 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN:
CB2-1 AND CB15-1
CB2-2 AND A77J2-11
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB2-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-11.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB2-2 AND A77J2-11.
GO TO PARA 9-24-1
NO
NO
REPLACE CIRCUIT BREAKER CB2.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-24-1.

END OF TASK

9-24-10. MUX L PYL INBD CIRCUIT BREAKER (CB1) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-9

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

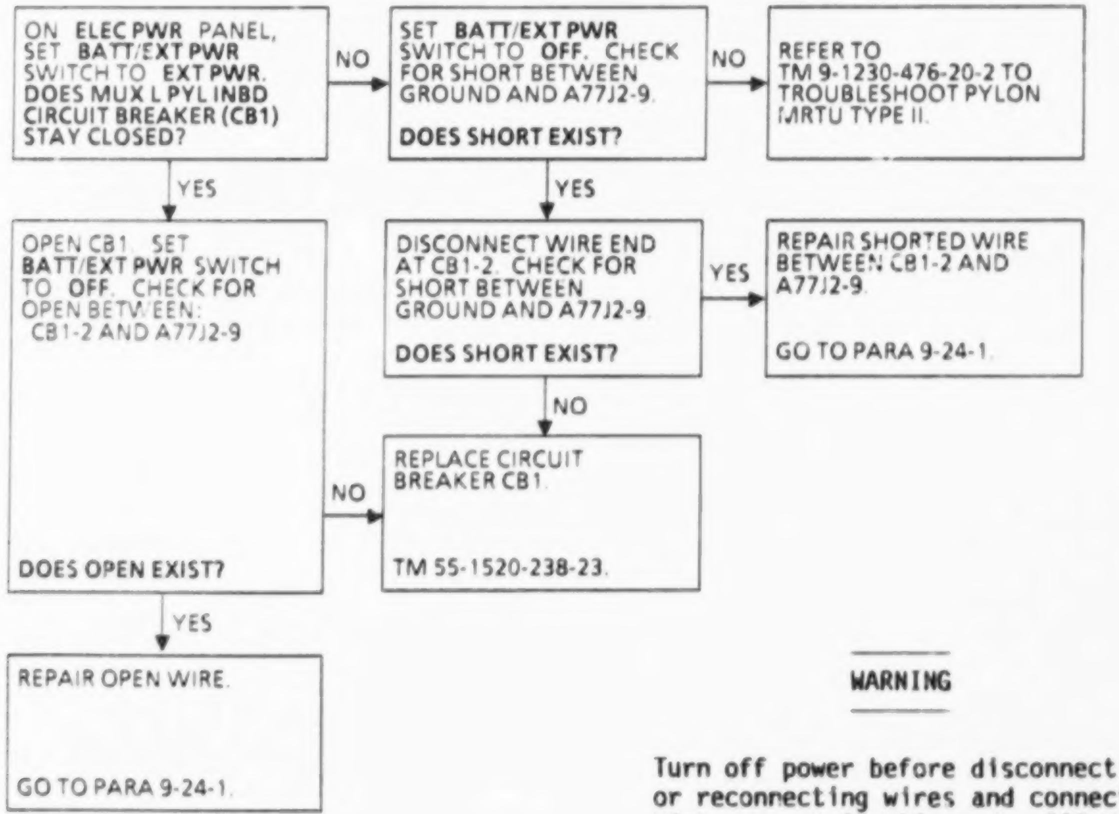
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX L PYL INBD CIRCUIT BREAKER (CB1) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-9. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
YES
OPEN CB1. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB1-2 AND A77J2-9
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB1-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-9. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB1-2 AND A77J2-9. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB1. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-24-11. MUX R PYL INBD CIRCUIT BREAKER (CB45) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-8

Tools: (para 9-24-10)

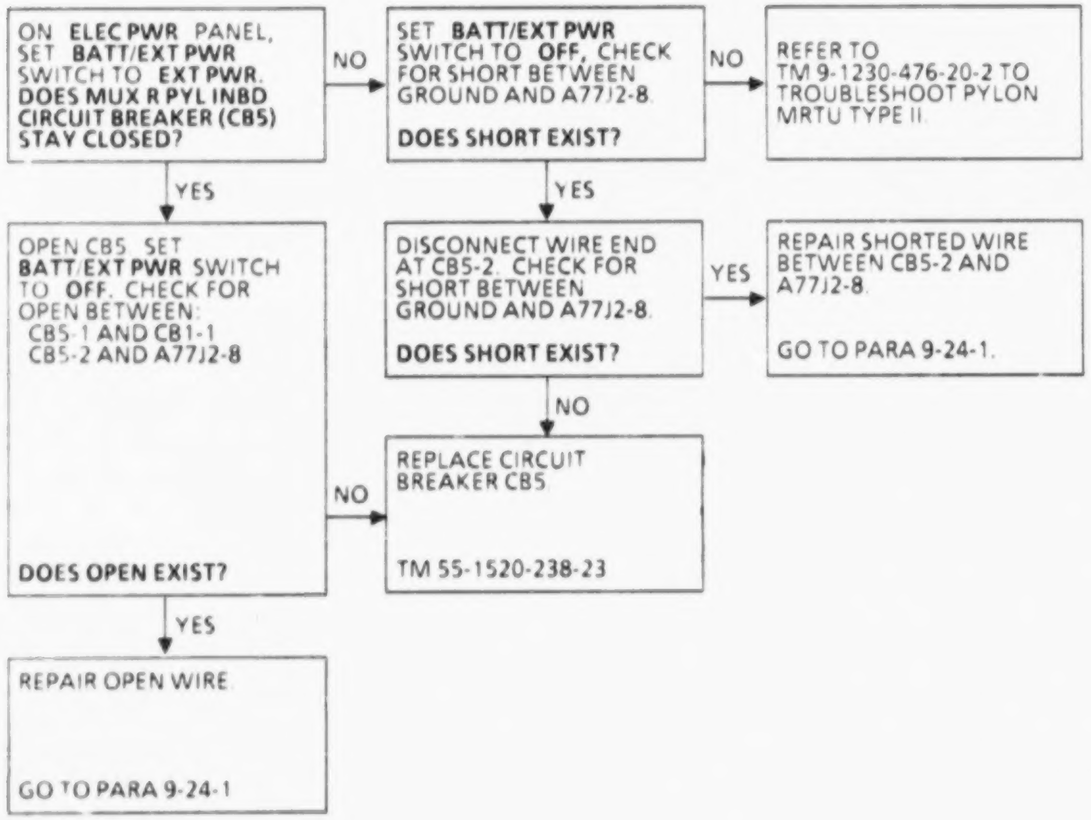
Personnel Required: (para 9-24-10)

References: (para 9-24-10)

Equipment Conditions: (para 9-24-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX R PYL INBD CIRCUIT BREAKER (CB5) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND A77J2-8. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.
YES
YES
OPEN CB5. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB5-1 AND CB1-1 CB5-2 AND A77J2-8
DOES OPEN EXIST?
DISCONNECT WIRE END AT CB5-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-8. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB5-2 AND A77J2-8. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB5. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1

END OF TASK

9-24-12. MUX R PYL OUTBD CIRCUIT BREAKER (CB6) - DOES NOT STAY CLOSED OR CONTINUITY TO PYLON MRTU TYPE II DOES NOT EXIST BETWEEN J4-A AND J2-10

Tools: (para 9-24-10)

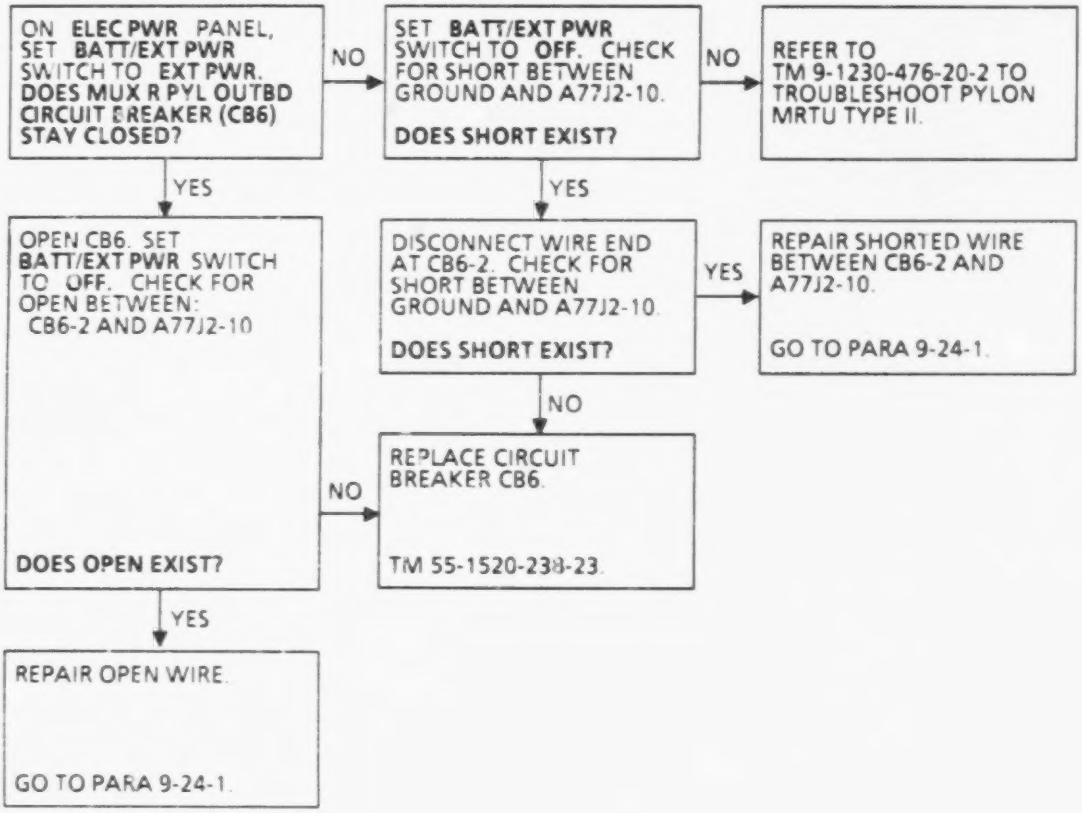
Personnel Required: (para 9-24-10)

References: (para 9-24-10)

Equipment Conditions: (para 9-24-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MUX R PYL OUTBD CIRCUIT BREAKER (CB6) STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A77J2-10.

DOES SHORT EXIST?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT PYLON MRTU TYPE II.

OPEN CB6. SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB6-2 AND A77J2-10

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB6-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-10.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB6-2 AND A77J2-10.

GO TO PARA 9-24-1.

REPLACE CIRCUIT BREAKER CB6.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-24-1.

END OF TASK

9-24-13. MUX FAB L CIRCUIT BREAKER (CB10) - DOES NOT STAY CLOSED OR CONTINUITY TO LEFT FAB MRTU TYPE I DOES NOT EXIST BETWEEN J4-A AND J2-14

Tools: (para 9-24-10)

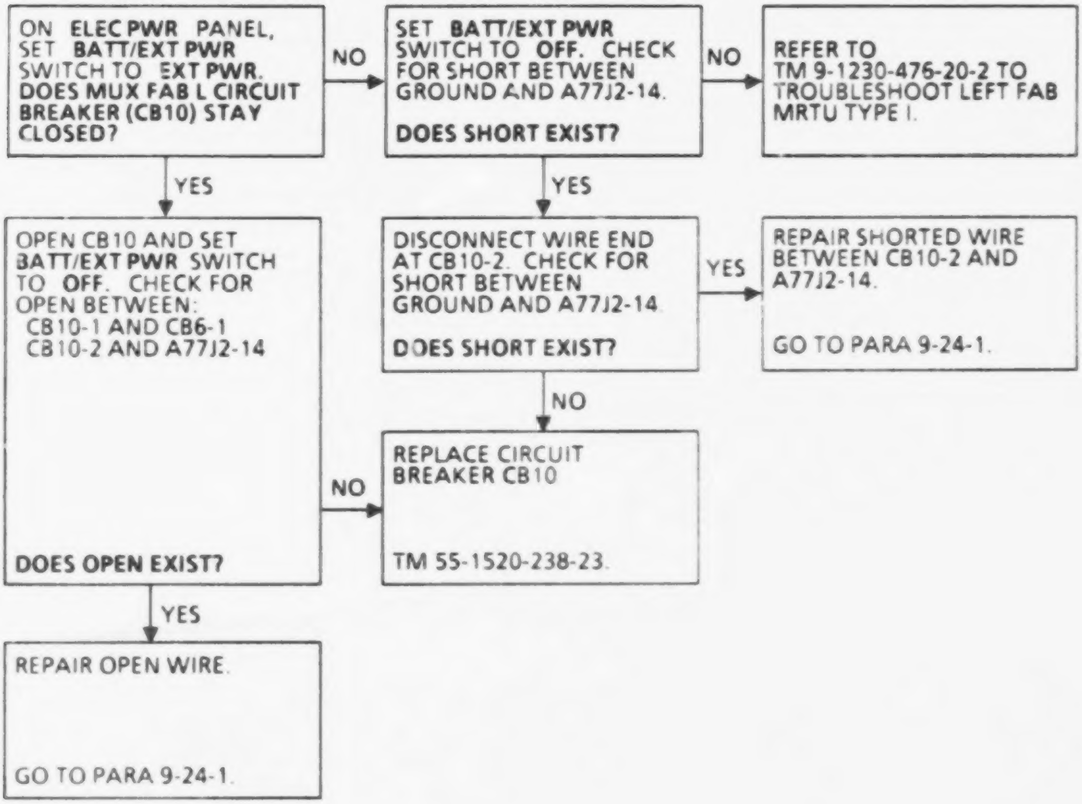
Personnel Required: (para 9-24-10)

References: (para 9-24-10)

Equipment Conditions: (para 9-24-10)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES MUX FAB L CIRCUIT BREAKER (CB10) STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A77J2-14.

DOES SHORT EXIST?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT LEFT FAB MRTU TYPE I.

OPEN CB10 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB10-1 AND CB6-1
CB10-2 AND A77J2-14

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB10-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-14.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB10-2 AND A77J2-14.

GO TO PARA 9-24-1.

REPLACE CIRCUIT BREAKER CB10

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-24-1.

END OF TASK

9-24-14. MUX FAB R CIRCUIT BREAKER (CB9) - DOES NOT STAY CLOSED OR CONTINUITY TO RIGHT FAB MRTU TYPE I DOES NOT EXIST BETWEEN J4-A AND J2-13

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

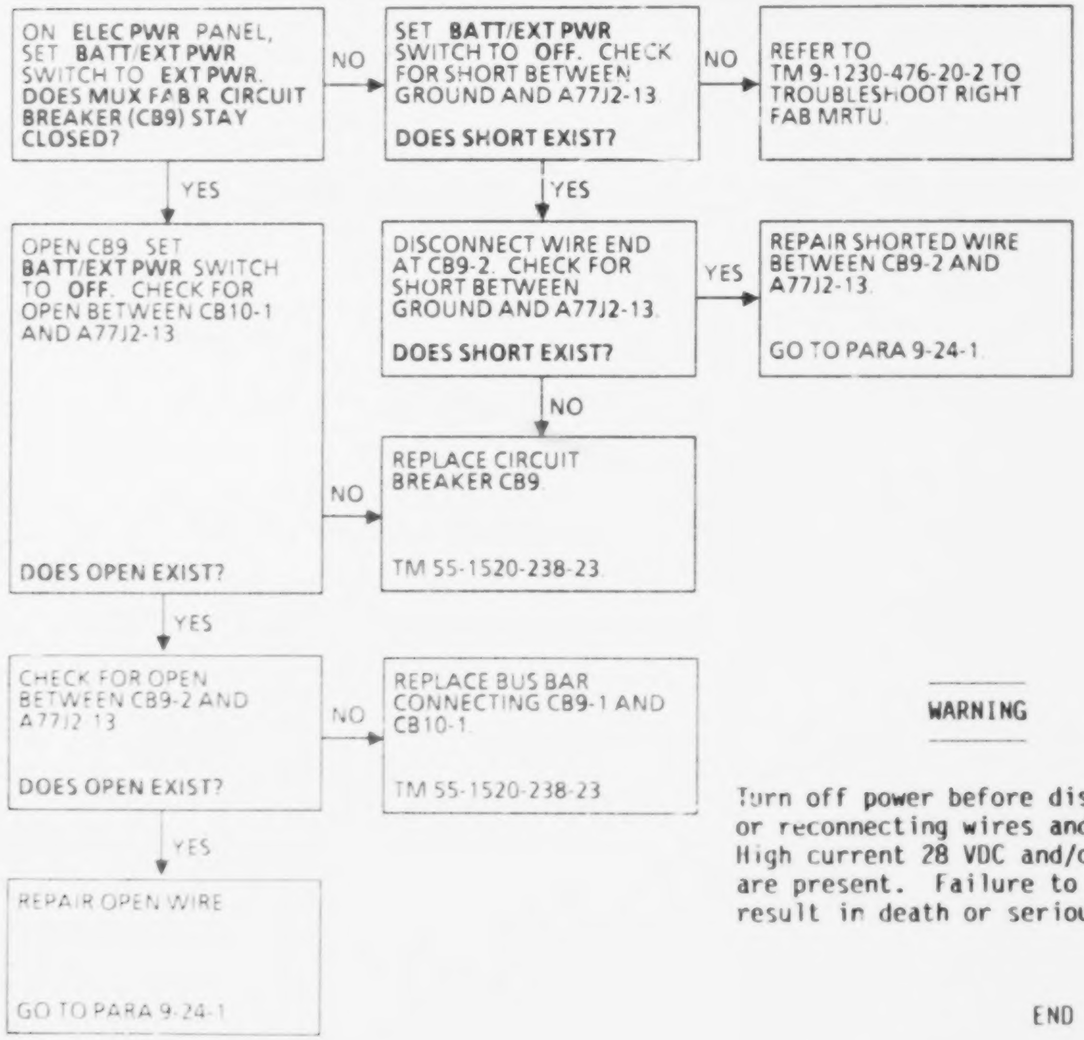
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES MUX FAB R CIRCUIT BREAKER (CB9) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J2-13. DOES SHORT EXIST?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT RIGHT FAB MRTU.
YES
YES
OPEN CB9. SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB10-1 AND A77J2-13. DOES OPEN EXIST?
DISCONNECT WIRE END AT CB9-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-13. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB9-2 AND A77J2-13. GO TO PARA 9-24-1.
NO
NO
REPLACE CIRCUIT BREAKER CB9. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN CB9-2 AND A77J2-13. DOES OPEN EXIST?
NO
REPLACE BUS BAR CONNECTING CB9-1 AND CB10-1. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-24-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-24-15. CDU CIRCUIT BREAKER (CB6) - DOES NOT STAY CLOSED

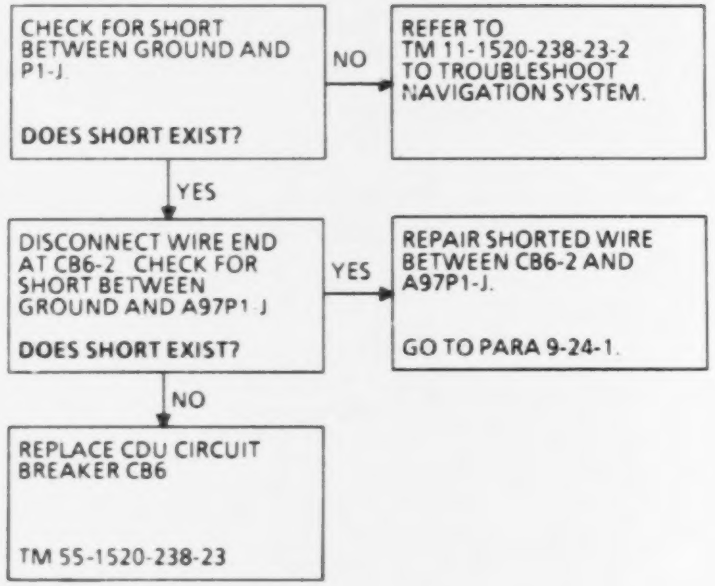
Tools: (para 9-24-14)

Personnel Required: (para 9-24-14)

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-24-14)


CHECK FOR SHORT BETWEEN GROUND AND P1-J. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT NAVIGATION SYSTEM.
YES
DISCONNECT WIRE END AT CB6-2. CHECK FOR SHORT BETWEEN GROUND AND A97P1-J. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB6-2 AND A97P1-J. GO TO PARA 9-24-1.
NO
REPLACE CDU CIRCUIT BREAKER CB6. TM 55-1520-238-23

END OF TASK

9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

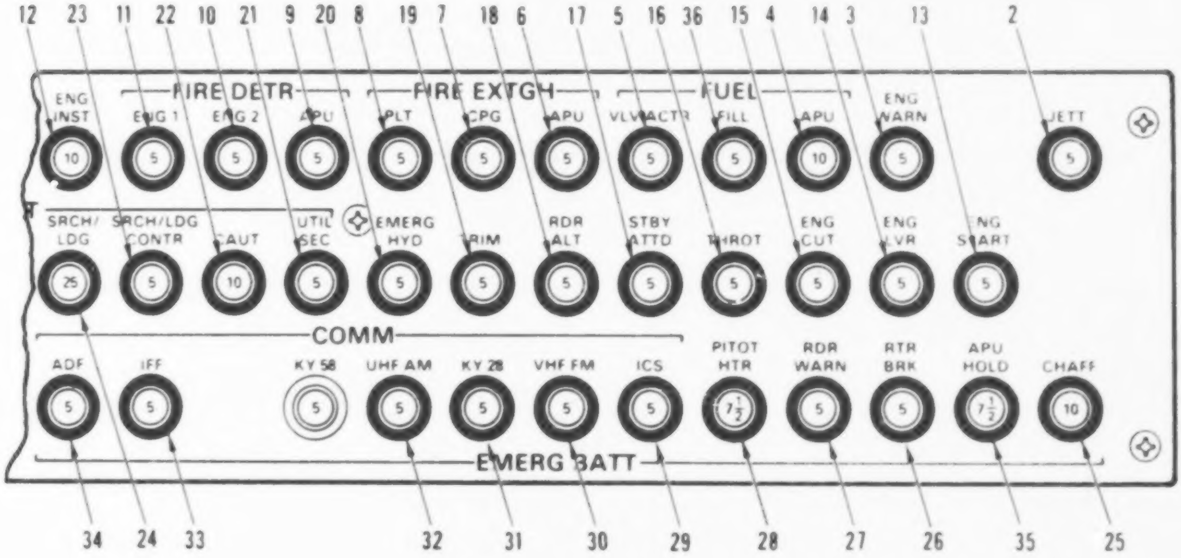
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



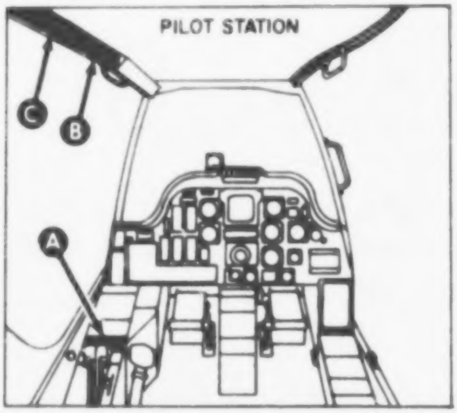
Ⓑ PILOT CENTER CIRCUIT BREAKER PANEL
D.C. EMERGENCY BATTERY CIRCUIT BREAKER

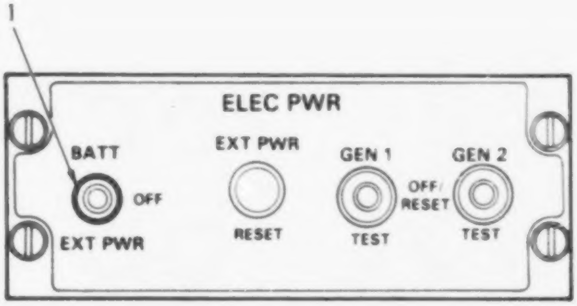
A. In aft avionics bay, check that CB148 is closed and battery is connected.

B. Disconnect A76P1, A76P5 and P463.

C. Complete operational check as follows:

	TASK	RESULT
1.	Check for short between ground and A76P5-1.	If short exists, go to para 9-25-4.
1.1	Check for continuity to **BTL DISCHARGE/APU** panel between J1-h and J1-B.	If continuity does not exist, go to para 9-25-7.
2.	Check for continuity to refuel panel between J1-h and J1-A.	If continuity does not exist, go to para 9-25-8.
3.	Check for continuity between P5-2 and P5-1, -3.	If continuity does not exist, go to para 9-25-5.
4.	Check for continuity to search light relay between P5-2 and P5-4.	If continuity does not exist, go to para 9-25-6.
5.	On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
6.	Check for 28 VDC at A402J29-1, -2, -3.	If 28 VDC is not present, go to para 9-3-1.
7.	Check for 28 VDC at P463-h.	If 28 VDC is not present, go to para 9-25-7.
8.	On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	





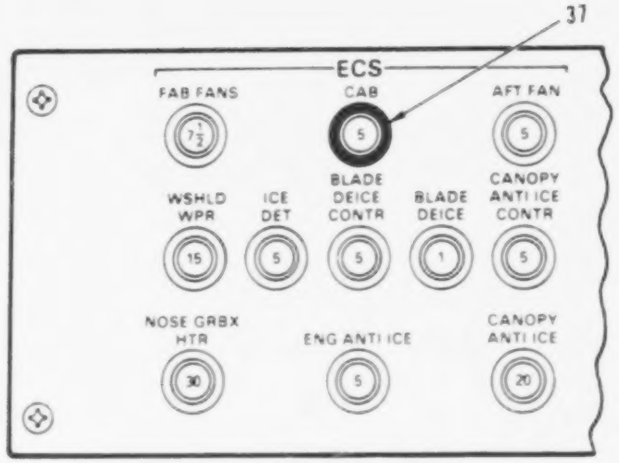
Ⓐ ELEC PWR PANEL MM04/1-1015-18

GO TO NEXT PAGE

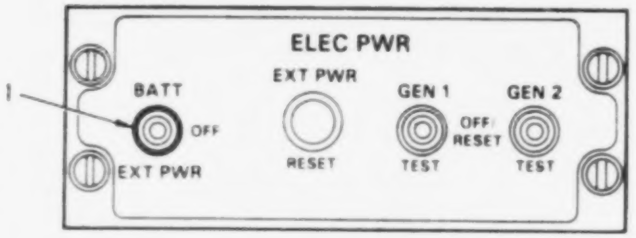
9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK (cont)

WARNING

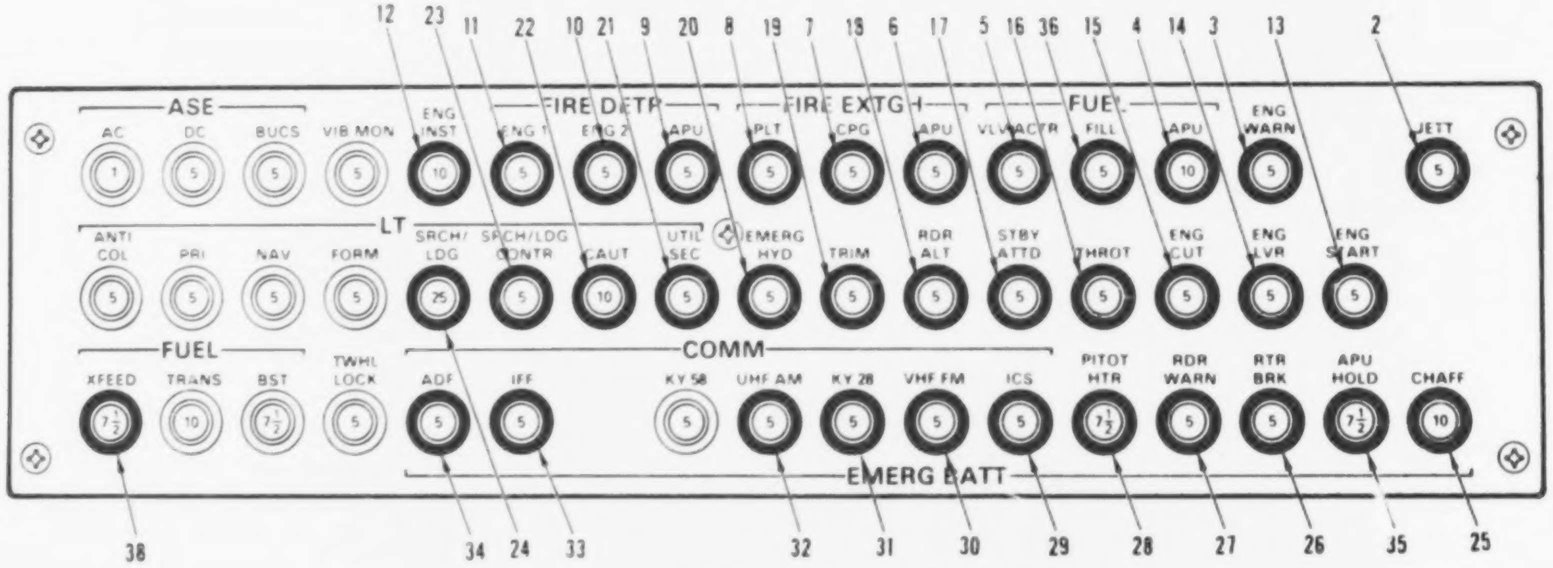
Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



C PILOT AFT CIRCUIT BREAKER PANEL



ELEC PWR PANEL



PILOT CENTER CIRCUIT BREAKER PANEL
D.C. EMERGENCY BATTERY CIRCUIT BREAKERS

MM04/1-1015-2C

TASK	RESULT
9. Reconnect A76P1, A76P5 and P463. Check that all pilot emergency battery circuit breakers are closed.	
10. On ELEC PWR panel, set BATT/EXT PWR switch (1) to EXT PWR.	
11. Check that all pilot emergency battery circuit breakers remain closed.	If JETT circuit breaker CB34 (2) does not stay closed, go to para 9-25-9. If ENG WARN circuit breaker CB52 (3) does not stay closed, go to para 9-25-10. If FUEL APU circuit breaker CB9 (4) does not stay closed, go to para 9-25-11. If FUEL VLV ACTR circuit breaker CB14 (5) does not stay closed, go to para 9-25-12. If FIRE EXTGH APU circuit breaker CB26 (6) does not stay closed, go to para 9-25-13. If FIRE EXTGH CPG circuit breaker CB15 (7) does not stay closed, go to para 9-25-14. If FIRE EXTGH PLT circuit breaker CB25 (8) does not stay closed, go to para 9-25-15. If FIRE DETR APU circuit breaker CB11 (9) does not stay closed, go to para 9-25-16. If FIRE DETR ENG 2 circuit breaker CB13 (10) does not stay closed, go to para 9-25-17. If FIRE DETR ENG 1 circuit breaker CB12 (11) does not stay closed, go to para 9-25-18. If ENG INST circuit breaker CB17 (12) does not stay closed, go to para 9-25-19. If ENG START circuit breaker CB58 (13) does not stay closed, go to para 9-25-20. If ENG LVR circuit breaker CB16 (14) does not stay closed, go to para 9-25-21. If FUEL XFEED circuit breaker CB55 (38) does not stay closed, go to para 9-25-42.

GO TO NEXT PAGE

9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
	If **ENG CUT** circuit breaker CB60 (15) does not stay closed, go to para 9-25-22.
	If **THROT** circuit breaker CB8 (16) does not stay closed, go to para 9-25-23.
	If **STBY ATTD** circuit breaker CB19 (17) does not stay closed, go to para 9-25-24.
	If **RDR ALT** circuit breaker CB31 (18) does not stay closed, go to para 9-25-25.
	If **TRIM** circuit breaker CB87 (19) does not stay closed, go to para 9-25-26.
	If **EMERG HYD** circuit breaker CB35 (20) does not stay closed, go to para 9-25-27.
	If **LT UTIL SEC** circuit breaker CB23 (21) does not stay closed, go to para 9-25-28.
	If **LT CAUT** circuit breaker CB21 (22) does not stay closed, go to para 9-25-30.
	If **LT SRCH/LDG CONTR** circuit breaker CB80 (23) does not stay closed, go to para 9-25-29.
	If **LT SRCH/LDG** circuit breaker CB22 (24) does not stay closed, go to para 9-25-6.
	If **CHAFF** circuit breaker CB48 (25) does not stay closed, go to para 9-25-31.
	If **RTR BRK** circuit breaker CB37 (26) does not stay closed, go to para 9-25-32.
	If **RAD WARN** circuit breaker CB53 (27) does not stay closed, go to para 9-25-33.
	If **PITOT HTR** circuit breaker CB36 (28) does not stay closed, go to para 9-25-34.
	If **COMM ICS** circuit breaker CB27 (29) does not stay closed, go to para 9-25-35.
	If **COMM VHF AM** circuit breaker CB64 (30) does not stay closed, go to para 9-25-36.
	If **COMM KY-28** circuit breaker CB30 (31) does not stay closed, go to para 9-25-37.
	If **COMM UHF AM** circuit breaker CB24 (32) does not stay closed, go to para 9-25-38.
	If **COMM IFF** circuit breaker CB29 (33) does not stay closed, go to para 9-25-39.
	If **COMM ADF** circuit breaker CB65 (34) does not stay closed, go to para 9-25-40.
	If **APU HOLD** circuit breaker CB10 (35) does not stay closed, go to para 9-25-7.
	If **FUEL FILL** circuit breaker CB32 (36) does not stay closed, go to para 9-25-8.
	If **ECS CAB** circuit breaker CB76 (37) does not stay closed, go to para 9-25-41.
12. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF** and disconnect P463.	
13. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**.	
14. Check for 28 VDC to pilot and CPG collective stick **ST JTSN** switch at J1-P, -R.	If 28 VDC is not present, go to para 9-25-9.
15. Check for 28 VDC to engine out warning at J1-N.	If 28 VDC is not present, go to para 9-25-10.
16. Check for 28 VDC to ground service utility receptacle at J1-z.	If 28 VDC is not present, go to para 9-25-11.
17. Check for 28 VDC to pilot fire extinguish panel at J1-C.	If 28 VDC is not present, go to para 9-25-12.
18. Check for 28 VDC to **BTL DISCHARGE/ APU** panel at J1-J.	If 28 VDC is not present, go to para 9-25-13.
19. Check for 28 VDC to CPG fire extinguish panel at J1-H.	If 28 VDC is not present, go to para 9-25-14.

GO TO NEXT PAGE

9-25-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - OPERATIONAL CHECK (cont)

TASK	RESULT
20. Check for 28 VDC to pilot fire extinguish panel at J1-D.	If 28 VDC is not present, go to para 9-25-15.
21. Check for 28 VDC to APU flame detector at J1-E.	If 28 VDC is not present, go to para 9-25-16.
22. Check for 28 VDC to engine 2 flame detector at J1-G.	If 28 VDC is not present, go to para 9-25-17.
23. Check for 28 VDC to engine 1 flame detector at J1-F.	If 28 VDC is not present, go to para 9-25-18.
24. Check for 28 VDC to signal data converter at J1-L and M.	If 28 VDC is not present, go to para 9-25-19.
25. Check for 28 VDC to pilot power quadrant at J1-c and x.	If 28 VDC is not present, go to para 9-25-20.
26. Check for 28 VDC to pilot fire extinguish panel at J1-K.	If 28 VDC is not present, go to para 9-25-21.
27. Check for 28 VDC to pilot and CPG collective sticks at J1-b.	If 28 VDC is not present, go to para 9-25-22.
28. Check for 28 VDC to CPG power quadrant panel at J1-d.	If 28 VDC is not present, go to para 9-25-23.
29. Check for 28 VDC to standby attitude indicator at J1-e.	If 28 VDC is not present, go to para 9-25-24.
30. Check for 28 VDC to radar altimeter receiver transmitter at J1-f and g.	If 28 VDC is not present, go to para 9-25-25.
31. Check for 28 VDC to pilot and CPG cyclic sticks at J1-Y and Z.	If 28 VDC is not present, go to para 9-25-26.
32. Check for 28 VDC to primary and utility manifolds at J1-k and m.	If 28 VDC is not present, go to para 9-25-27.
33. Check for 28 VDC to utility lights at J1-U and W.	If 28 VDC is not present, go to para 9-25-28.
34. Check for 28 VDC to pilot and CPG collective sticks - search light control at J1-V.	If 28 VDC is not present, go to para 9-25-29.

TASK	RESULT
35. Check for 28 VDC to pilot master and caution/warning panels at J1-y.	If 28 VDC is not present, go to para 9-25-30.
36. Check for 28 VDC to chaff dispense control panel at J1-t.	If 28 VDC is not present, go to para 9-25-31.
37. Check for 28 VDC to rotor brake pressure switch at J1-n.	If 28 VDC is not present, go to para 9-25-32.
38. Check for 28 VDC to control detecting set at J1-q.	If 28 VDC is not present, go to para 9-25-33.
39. Check for 28 VDC to pilot **ANTI-ICE** panel at J1-s.	If 28 VDC is not present, go to para 9-25-34.
40. Check for 28 VDC to audio junction unit at J1-a.	If 28 VDC is not present, go to para 9-25-35.
41. Check for 28 VDC to phase front homing module at J1-w.	If 28 VDC is not present, go to para 9-25-36.
42. Check for 28 VDC to secure voice control panel at J1-p.	If 28 VDC is not present, go to para 9-25-37.
43. Check for 28 VDC to UHF-AM radio control panel at J1-v.	If 28 VDC is not present, go to para 9-25-38.
44. Check for 28 VDC to IFF receiver transmitter at J1-S.	If 28 VDC is not present, go to para 9-25-39.
45. Check for 28 VDC to direction finder receiver at J1-r.	If 28 VDC is not present, go to para 9-25-40.
46. Check for 28 VDC to **AUX/ANTI-ICE** panel P1-2.	If 28 VDC is not present, go to para 9-25-41.
47. Check for 28 VDC to engine 1 and 2 fuel valve actuators at P1-32.	If 28 VDC is not present, go to para 9-25-42.

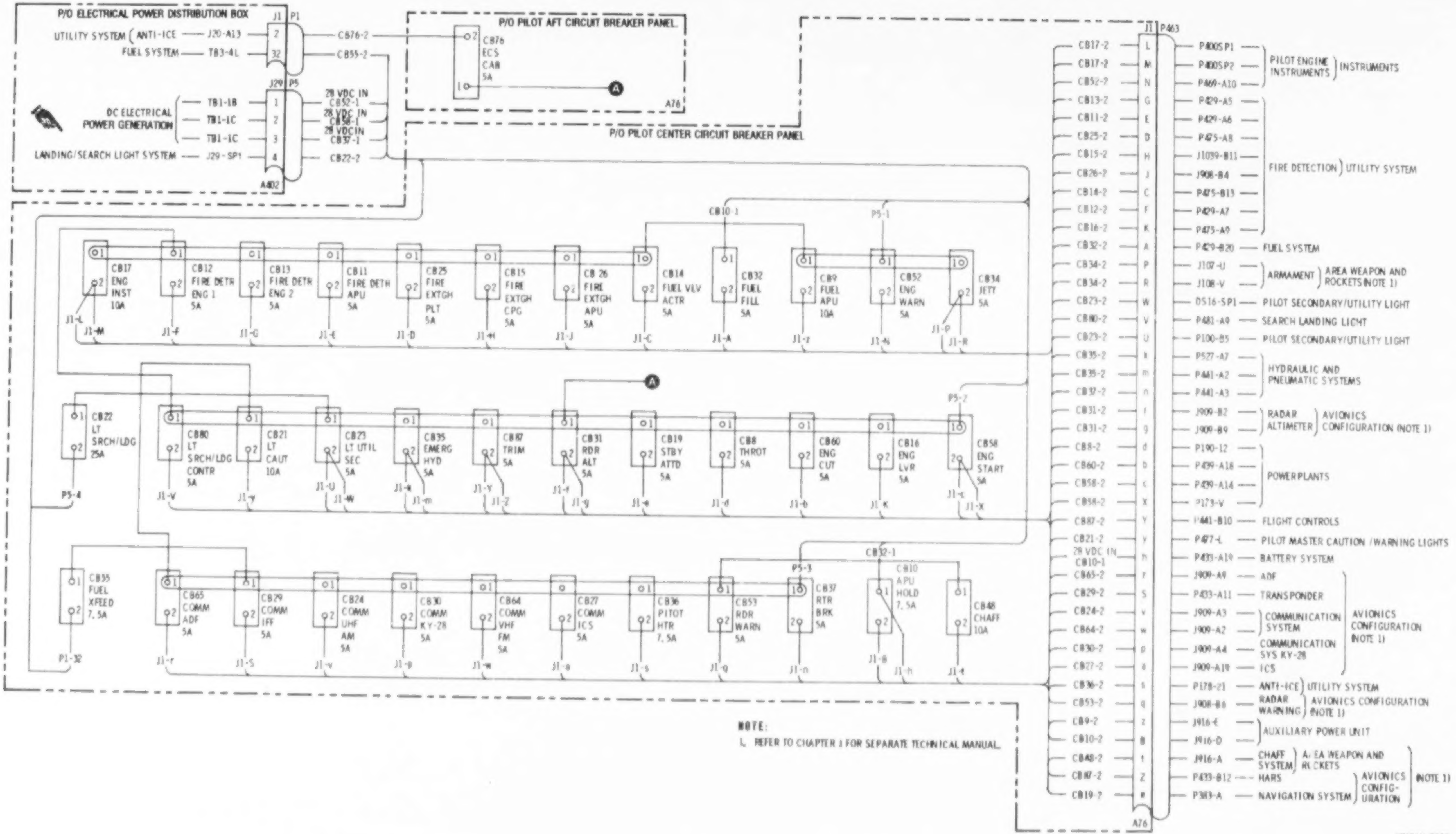
D. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.

E. Reconnect P463.

F. Remove external power - Electrical (TM 55-1520-238-23).

END OF TASK

9-25-2. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - INTERCONNECT DIAGRAM

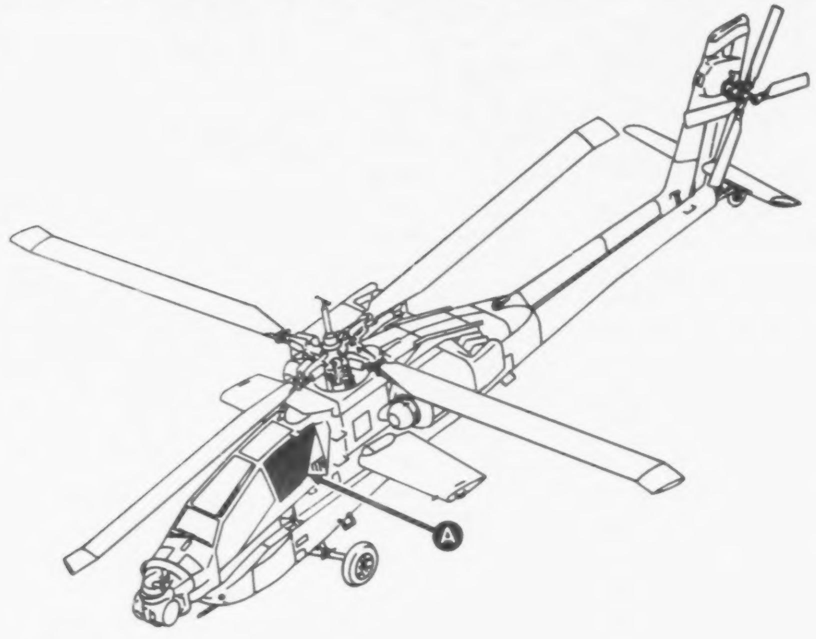


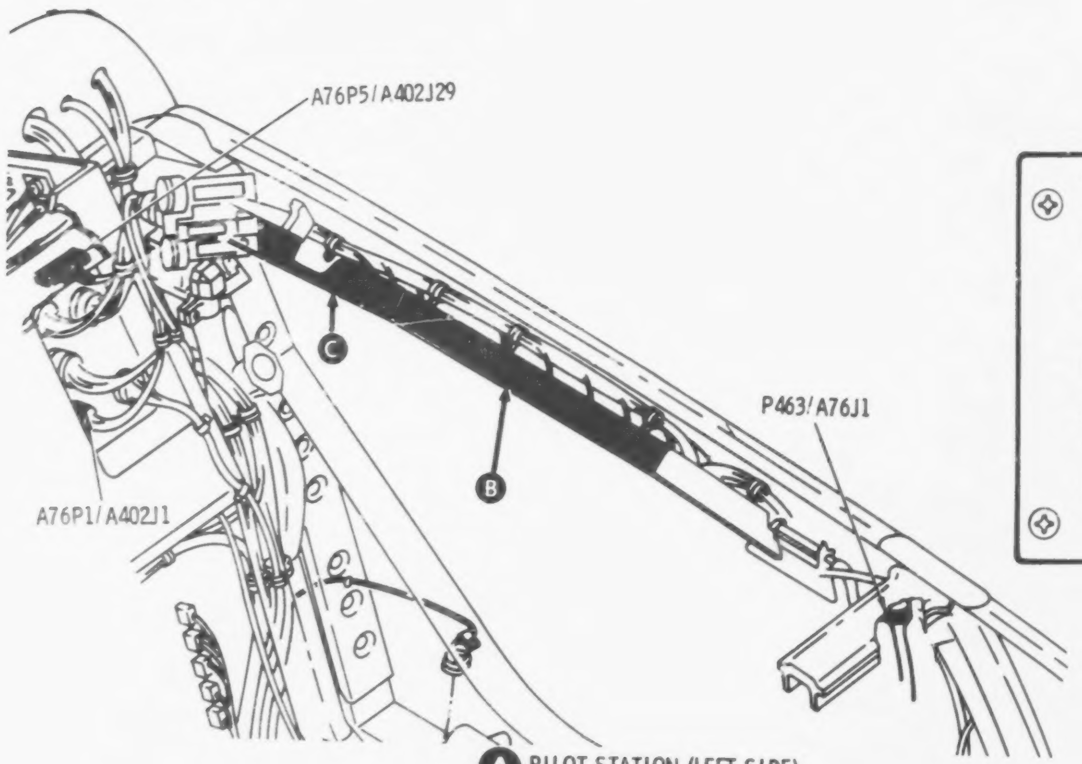
NOTE:

1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

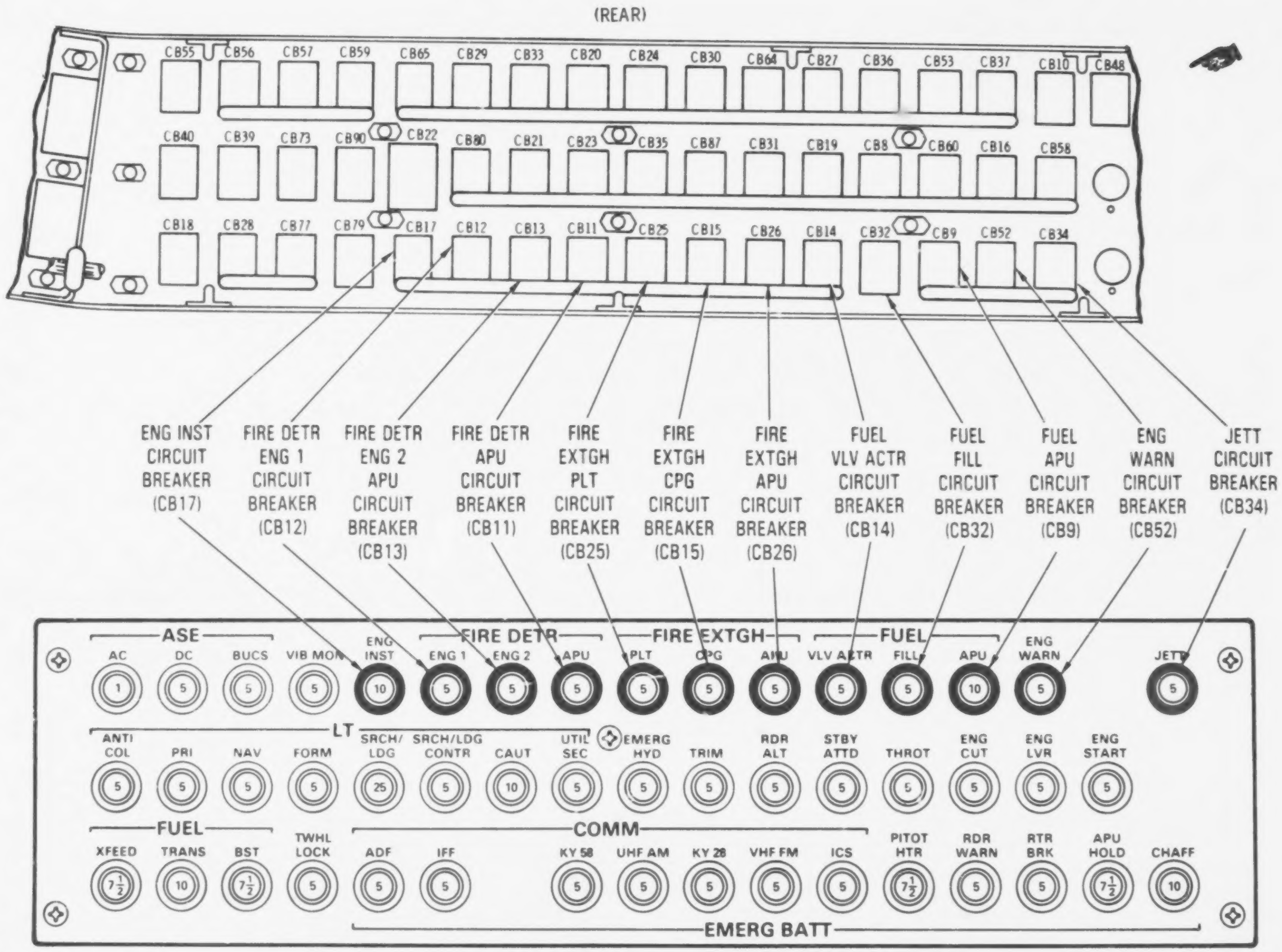
MM04/1-768G

9-25-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION





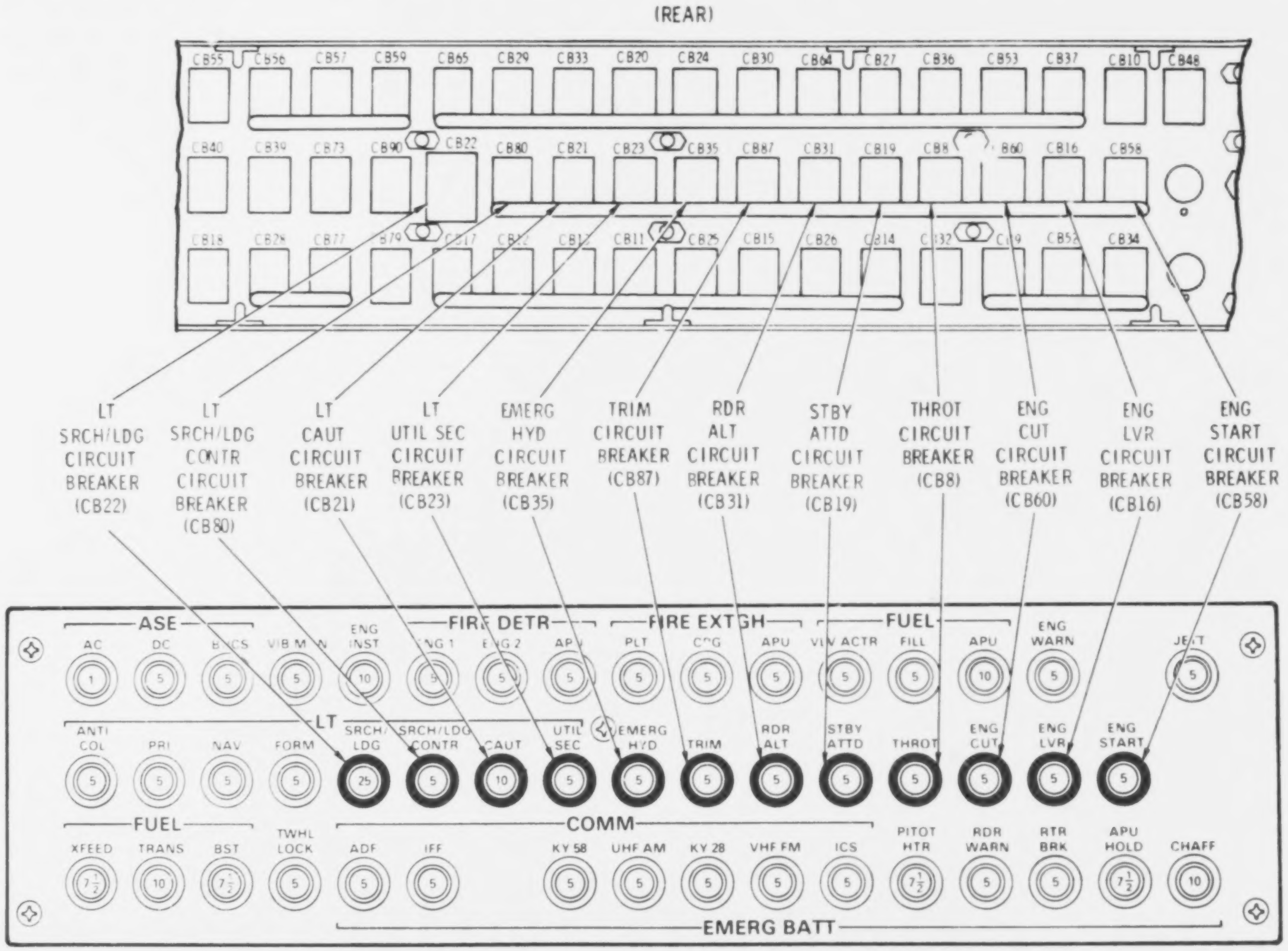
A PILOT STATION (LEFT SIDE)


(REAR)
CB55 CB56 CB57 CB59 CB65 CB29 CB33 CB20 CB24 CB30 CB64 CB27 CB36 CB53 CB37 CB10 CB48
CB40 CB39 CB73 CB90 CB22 CB80 CB21 CB23 CB35 CB87 CB31 CB19 CB8 CB60 CB16 CB58
CB18 CB28 CB77 CB79 CB17 CB12 CB13 CB11 CB25 CB15 CB26 CB14 CB32 CB9 CB52 CB34
ENG INST CIRCUIT BREAKER (CB17)
FIRE DETR ENG 1 CIRCUIT BREAKER (CB12)
FIRE DETR ENG 2 APU CIRCUIT BREAKER (CB13)
FIRE DETR APU CIRCUIT BREAKER (CB11)
FIRE EXTGH PLT CIRCUIT BREAKER (CB25)
FIRE EXTGH CPG CIRCUIT BREAKER (CB15)
FIRE EXTGH APU CIRCUIT BREAKER (CB26)
FUEL VLV ACTR CIRCUIT BREAKER (CB14)
FUEL FILL CIRCUIT BREAKER (CB32)
FUEL APU CIRCUIT BREAKER (CB9)
ENG WARN CIRCUIT BREAKER (CB52)
JETT CIRCUIT BREAKER (CB34)
ASE
AC 1
DC 5
BUCS 5
VIB MON 5
ENG INST 10
FIRE DETR
ENG 1 5
ENG 2 5
APU 5
FIRE EXTGH
PLT 5
CPG 5
APU 5
FUEL
VLV ACTR 5
FILL 5
APU 10
ENG WARN 5
JETT 5
LT
ANTI COL 5
PRI 5
NAV 5
FORM 5
SRCH/LDG 25
SRCH/LDG CONTR 5
CAUT 10
UTIL SEC 5
EMERG HYD 5
TRIM 5
RDR ALT 5
STBY ATTD 5
THROT 5
ENG CUT 5
ENG LVR 5
ENG START 5
FUEL
XFEED 7½
TRANS 10
BST 7½
TWHL LOCK 5
COMM
ADF 5
IFF 5
KY 58 5
UHF AM 5
KY 28 5
VHF FM 5
ICS 5
PITOT HTR 7½
RDR WARN 5
RTR BRK 5
APU HOLD 7½
CHAFF 10
EMERG BATT

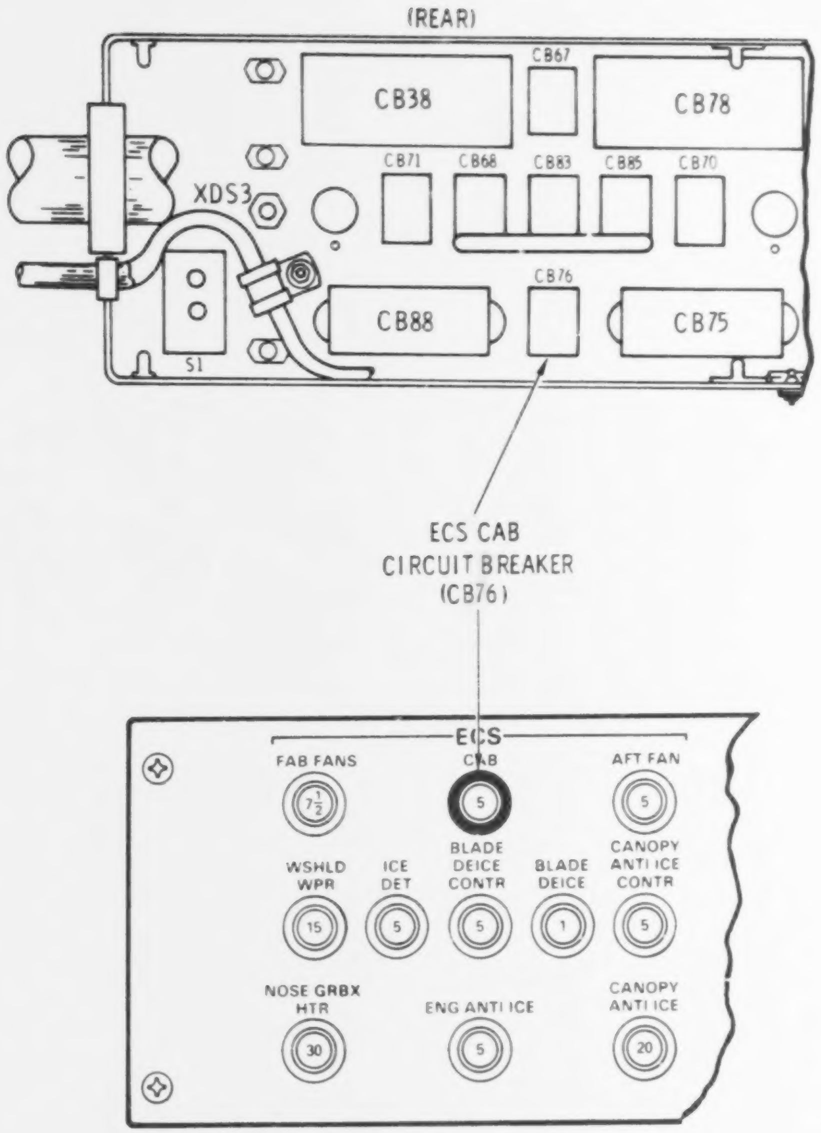
B PILOT CENTER CIRCUIT BREAKER PANEL
(FRONT)

MM04/1-1146-1C

9-25-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION)-ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



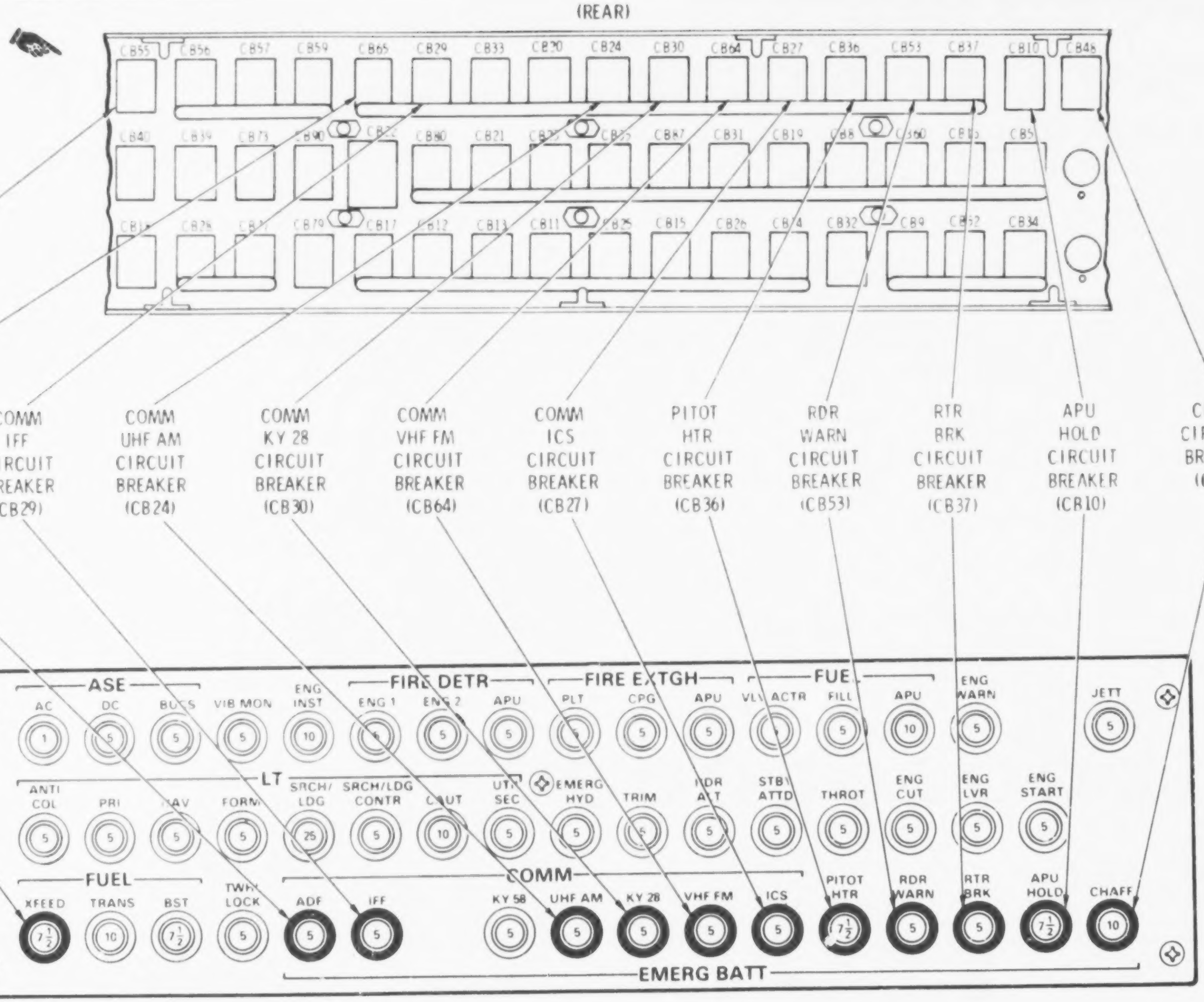
B PILOT CENTER CIRCUIT BREAKER PANEL
(FRONT)



C PILOT AFT CIRCUIT BREAKER PANEL
(FRONT)

MM04/1-1146-2D

9-25-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



B PILOT CENTER CIRCUIT BREAKER PANEL

(FRONT)

MM04/1-1146-3B

9-25-4. SHORT EXISTS BETWEEN GROUND AND A76P5-1, -2, -3

Tools:

Nomenclature	Part Number (NSN)
Multimeter AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

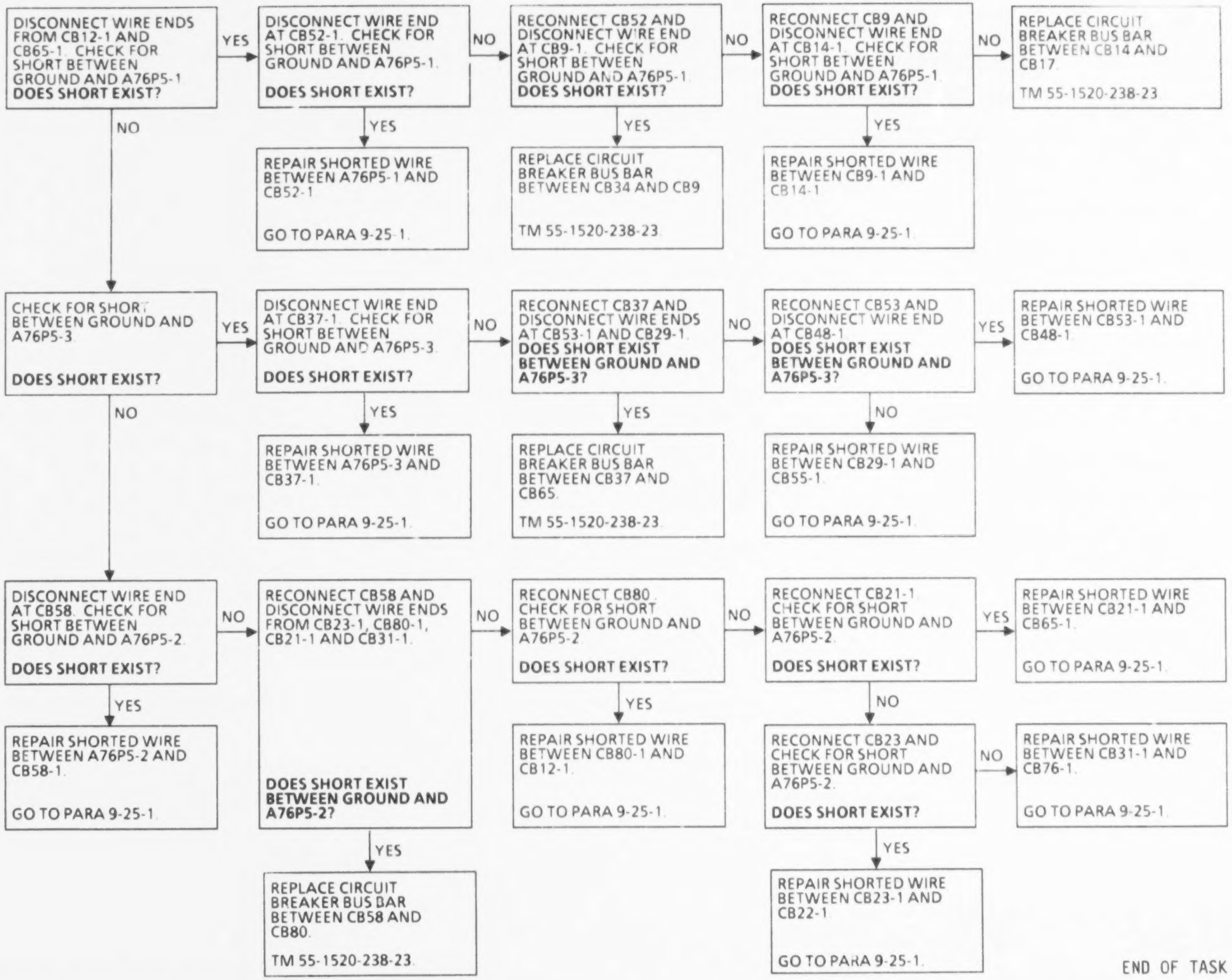
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-25-1	All pilot 28 VDC emergency bus circuit breakers open
Para 9-15-2	Pilot circuit breaker panel accessing completed



DISCONNECT WIRE ENDS FROM CB12-1 AND CB65-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. **DOES SHORT EXIST?**

DISCONNECT WIRE END AT CB52-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. **DOES SHORT EXIST?**

RECONNECT CB52 AND DISCONNECT WIRE END AT CB9-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. **DOES SHORT EXIST?**

RECONNECT CB9 AND DISCONNECT WIRE END AT CB14-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-1. **DOES SHORT EXIST?**

REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB14 AND CB17. TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN A76P5-1 AND CB52-1. GO TO PARA 9-25-1.

REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB34 AND CB9. TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN CB9-1 AND CB14-1. GO TO PARA 9-25-1.

CHECK FOR SHORT BETWEEN GROUND AND A76P5-3. **DOES SHORT EXIST?**

DISCONNECT WIRE END AT CB37-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-3. **DOES SHORT EXIST?**

RECONNECT CB37 AND DISCONNECT WIRE ENDS AT CB53-1 AND CB29-1. **DOES SHORT EXIST BETWEEN GROUND AND A76P5-3?**

RECONNECT CB53 AND DISCONNECT WIRE END AT CB48-1. **DOES SHORT EXIST BETWEEN GROUND AND A76P5-3?**

REPAIR SHORTED WIRE BETWEEN CB53-1 AND CB48-1. GO TO PARA 9-25-1.

REPAIR SHORTED WIRE BETWEEN A76P5-3 AND CB37-1. GO TO PARA 9-25-1.

REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB37 AND CB65. TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN CB29-1 AND CB55-1. GO TO PARA 9-25-1.

DISCONNECT WIRE END AT CB58. CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. **DOES SHORT EXIST?**

RECONNECT CB58 AND DISCONNECT WIRE ENDS FROM CB23-1, CB80-1, CB21-1 AND CB31-1. **DOES SHORT EXIST BETWEEN GROUND AND A76P5-2?**

RECONNECT CB80. CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. **DOES SHORT EXIST?**

RECONNECT CB21-1. CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE BETWEEN CB21-1 AND CB65-1. GO TO PARA 9-25-1.

REPAIR SHORTED WIRE BETWEEN A76P5-2 AND CB58-1. GO TO PARA 9-25-1.

REPAIR SHORTED WIRE BETWEEN CB80-1 AND CB12-1. GO TO PARA 9-25-1.

RECONNECT CB23 AND CHECK FOR SHORT BETWEEN GROUND AND A76P5-2. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE BETWEEN CB31-1 AND CB76-1. GO TO PARA 9-25-1.

REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB58 AND CB80. TM 55-1520-238-23.

REPAIR SHORTED WIRE BETWEEN CB23-1 AND CB22-1. GO TO PARA 9-25-1.

END OF TASK

9-25-5. CONTINUITY - DOES NOT EXIST BETWEEN A76P5-2 AND A76P5-1, -3

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

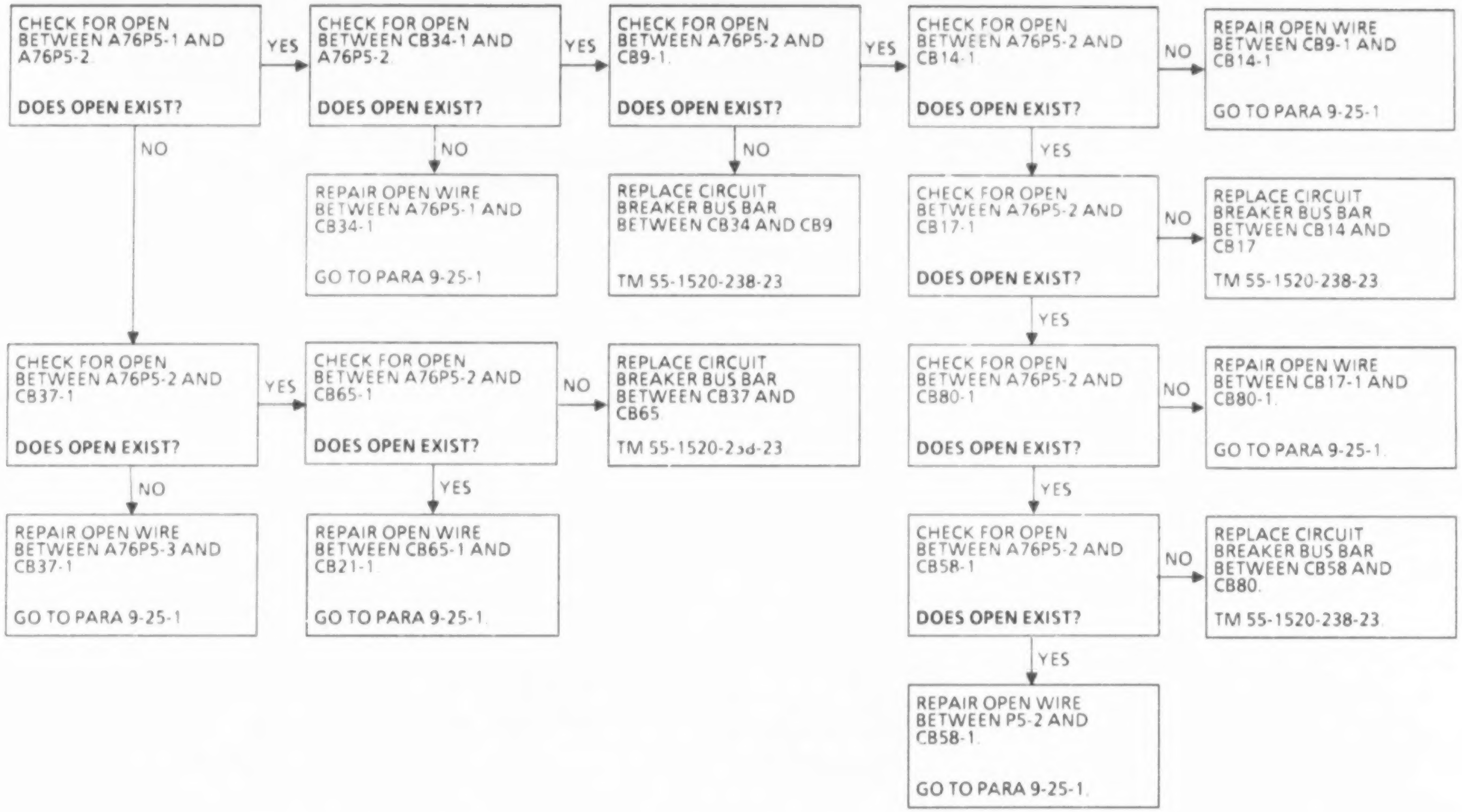
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed


CHECK FOR OPEN BETWEEN A76P5-1 AND A76P5-2. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN CB34-1 AND A76P5-2. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB9-1. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB14-1. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN CB9-1 AND CB14-1. GO TO PARA 9-25-1.
NO
NO
REPAIR OPEN WIRE BETWEEN A76P5-1 AND CB34-1. GO TO PARA 9-25-1.
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB34 AND CB9. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB17-1. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB14 AND CB17. TM 55-1520-238-23.
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB37-1. DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A76P5-2 AND CB65-1. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB37 AND CB65. TM 55-1520-238-23.
CHECK FOR OPEN BETWEEN A76P5-2 AND CB80-1. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN CB17-1 AND CB80-1. GO TO PARA 9-25-1.
NO
YES
YES
REPAIR OPEN WIRE BETWEEN A76P5-3 AND CB37-1. GO TO PARA 9-25-1.
REPAIR OPEN WIRE BETWEEN CB65-1 AND CB21-1. GO TO PARA 9-25-1.
CHECK FOR OPEN BETWEEN A76P5-2 AND CB58-1. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB58 AND CB80. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE BETWEEN P5-2 AND CB58-1. GO TO PARA 9-25-1.

END OF TASK

9-25-6. LT SRCH/LDG CIRCUIT BREAKER (CB22) - DOES NOT STAY CLOSED OR CONTINUITY TO SEARCH LIGHT RELAY DOES NOT EXIST BETWEEN A76P5-2 AND -4

Tools: (para 9-25-5)

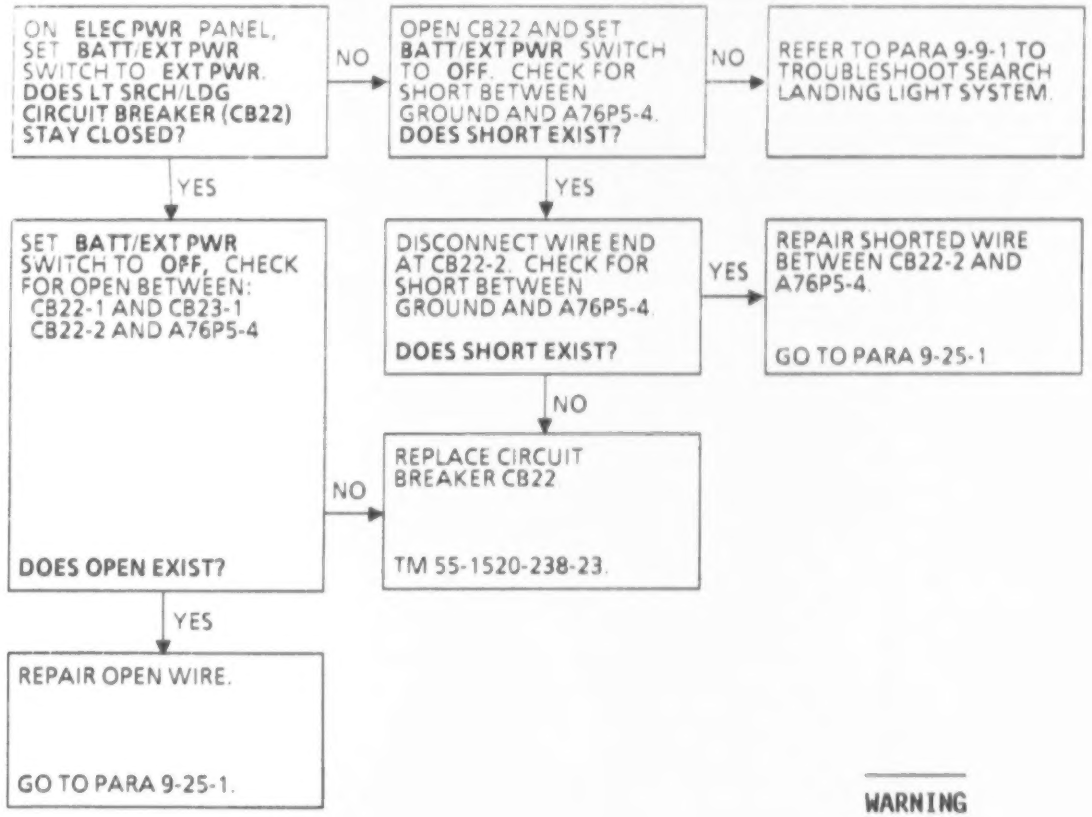
Personnel Required: (para 9-25-5)

References: (para 9-25-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

REFER TO VOLTAGE WARNING


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES LT SRCH/LDG CIRCUIT BREAKER (CB22) STAY CLOSED?**
NO
OPEN CB22 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P5-4. **DOES SHORT EXIST?**
NO
REFER TO PARA 9-9-1 TO TROUBLESHOOT SEARCH LANDING LIGHT SYSTEM.
YES
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN: CB22-1 AND CB23-1 CB22-2 AND A76P5-4 **DOES OPEN EXIST?**
YES
DISCONNECT WIRE END AT CB22-2. CHECK FOR SHORT BETWEEN GROUND AND A76P5-4. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE BETWEEN CB22-2 AND A76P5-4. GO TO PARA 9-25-1
NO
NO
REPLACE CIRCUIT BREAKER CB22. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-7. APU HOLD CIRCUIT BREAKER (CB10) - DOES NOT STAY CLOSED OR CONTINUITY TO BTL DISCHARGE/APU PANEL DOES NOT EXIST BETWEEN A76J1-h AND -B

Tools: (para 9-25-5)

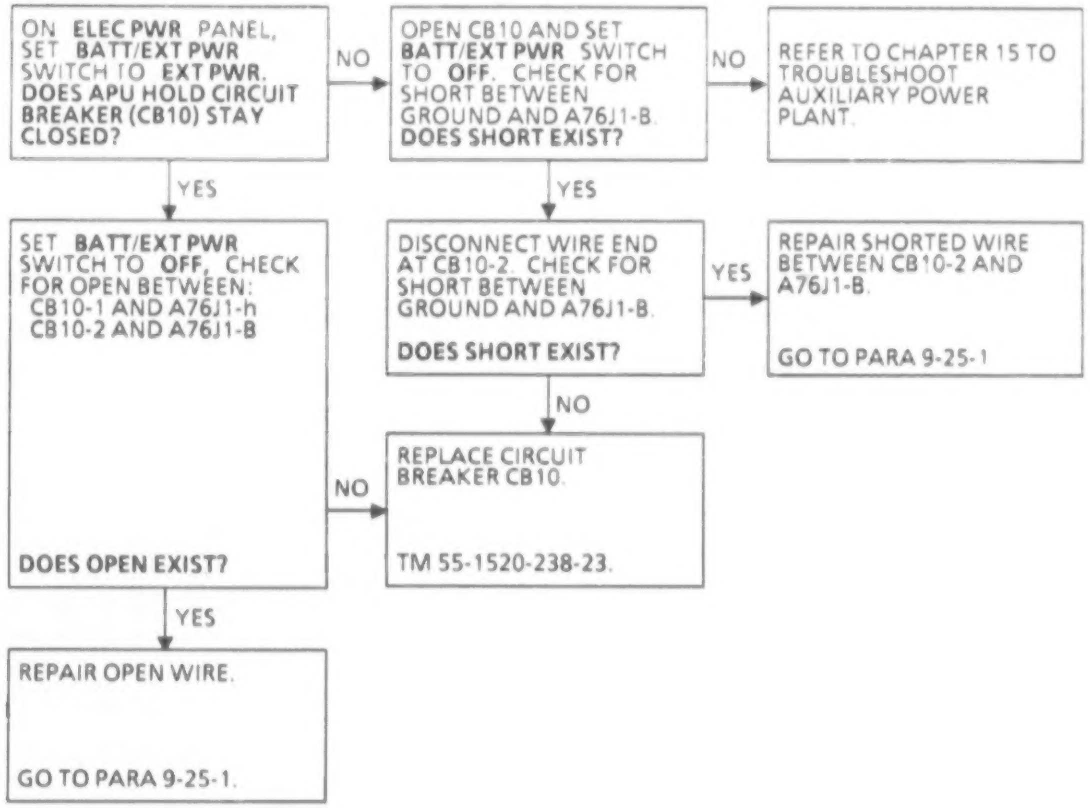
Personnel Required: (para 9-25-5)

References: (para 9-25-5)

Equipment Conditions: (para 9-25-6)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES APU HOLD CIRCUIT BREAKER (CB10) STAY CLOSED?**
NO
OPEN CB10 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-B. **DOES SHORT EXIST?**
NO
REFER TO CHAPTER 15 TO TROUBLESHOOT AUXILIARY POWER PLANT.
YES
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN: CB10-1 AND A76J1-h CB10-2 AND A76J1-B **DOES OPEN EXIST?**
YES
DISCONNECT WIRE END AT CB10-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-B. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE BETWEEN CB10-2 AND A76J1-B. GO TO PARA 9-25-1
NO
NO
REPLACE CIRCUIT BREAKER CB10. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-8. FUEL FILL CIRCUIT BREAKER (CB32) - DOES NOT STAY CLOSED OR CONTINUITY TO REFUEL PANEL DOES NOT EXIST BETWEEN A76J1-h AND -A

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

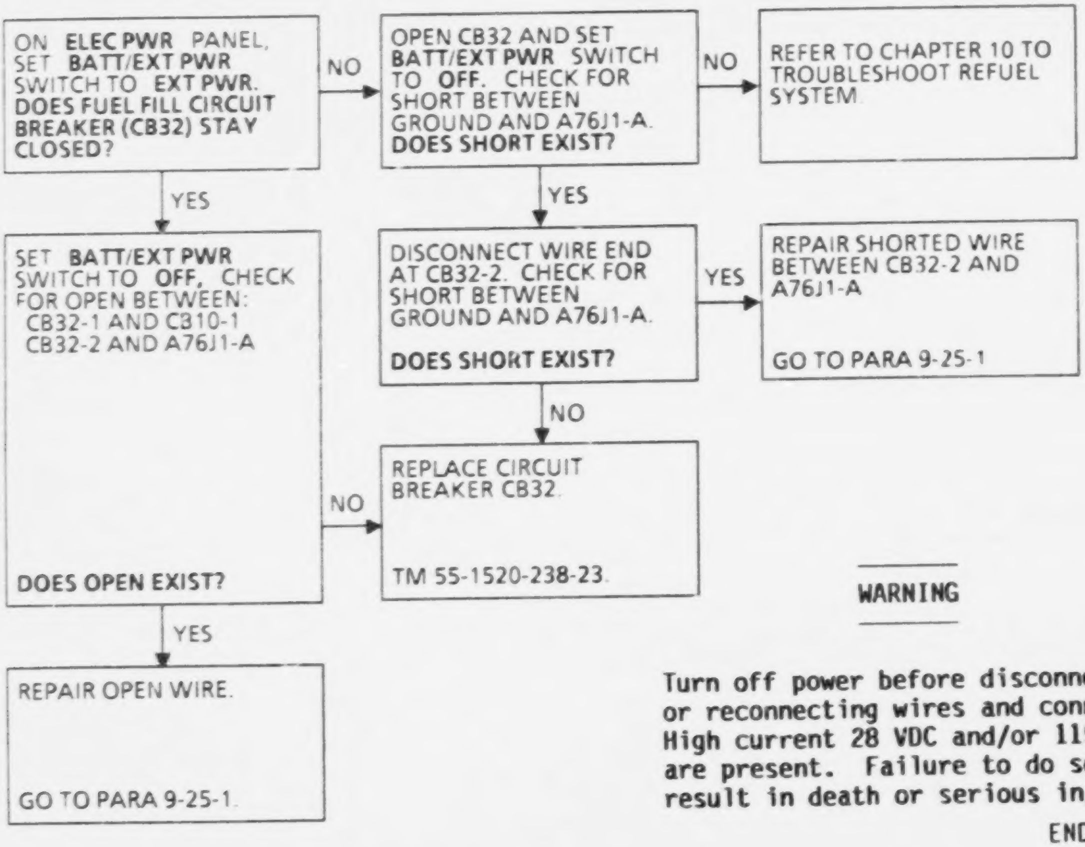
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES FUEL FILL CIRCUIT BREAKER (CB32) STAY CLOSED?**

OPEN CB32 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-A. **DOES SHORT EXIST?**

REFER TO CHAPTER 10 TO TROUBLESHOOT REFUEL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB32-1 AND CB10-1
CB32-2 AND A76J1-A

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB32-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-A.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB32-2 AND A76J1-A

GO TO PARA 9-25-1

REPLACE CIRCUIT BREAKER CB32.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-9. JETT CIRCUIT BREAKER (CB34) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG COLLECTIVE STICK ST JETT SWITCH IS NOT PRESENT AT A76J1-P, -R

Tools: (para 9-25-8)

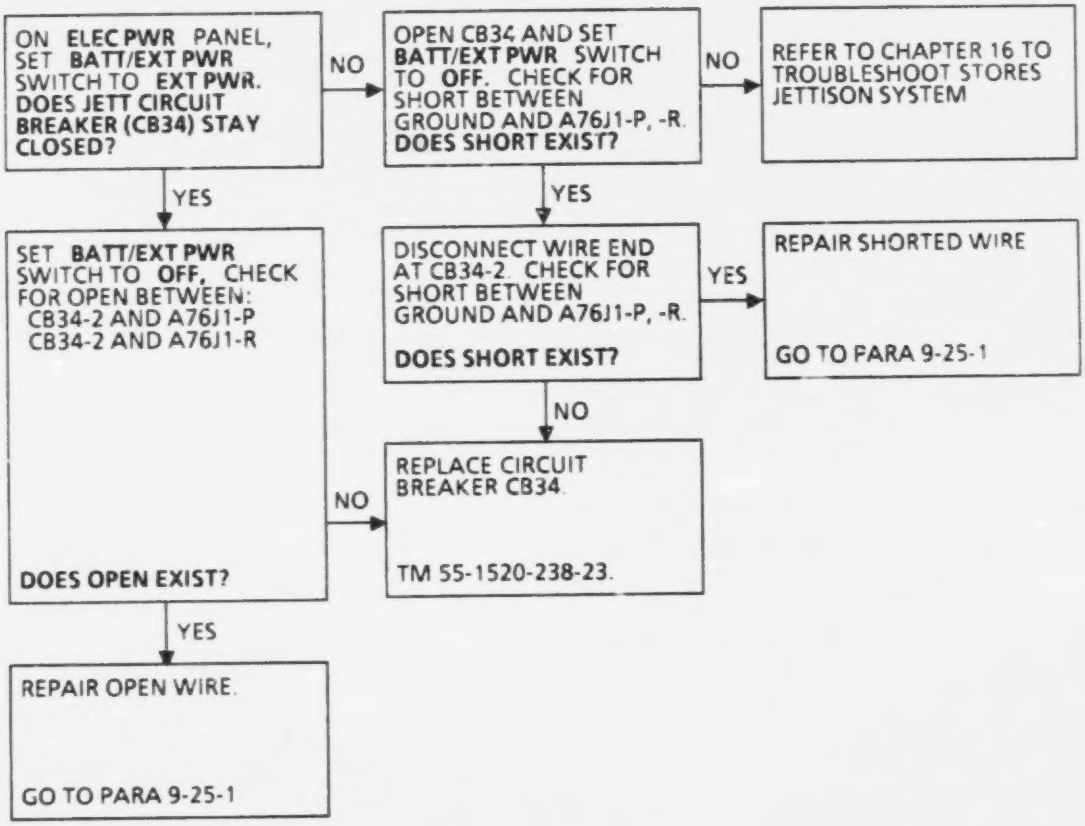
Personnel Required: (para 9-25-8)

References: (para 9-25-8)

Equipment Conditions: (para 9-25-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES JETT CIRCUIT BREAKER (CB34) STAY CLOSED?**

OPEN CB34 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-P, -R. **DOES SHORT EXIST?**

REFER TO CHAPTER 16 TO TROUBLESHOOT STORES JETTISON SYSTEM

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB34-2 AND A76J1-P
CB34-2 AND A76J1-R

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB34-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-P, -R.

DOES SHORT EXIST?

REPAIR SHORTED WIRE

GO TO PARA 9-25-1

REPLACE CIRCUIT BREAKER CB34.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1

END OF TASK

best copy available

Reproduced from poor document.

9-25-10. ENG WARN CIRCUIT BREAKER (CB52) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE OUT WARNING UNIT IS NOT PRESENT AT A76J1-N

Tools: (para 9-25-8)

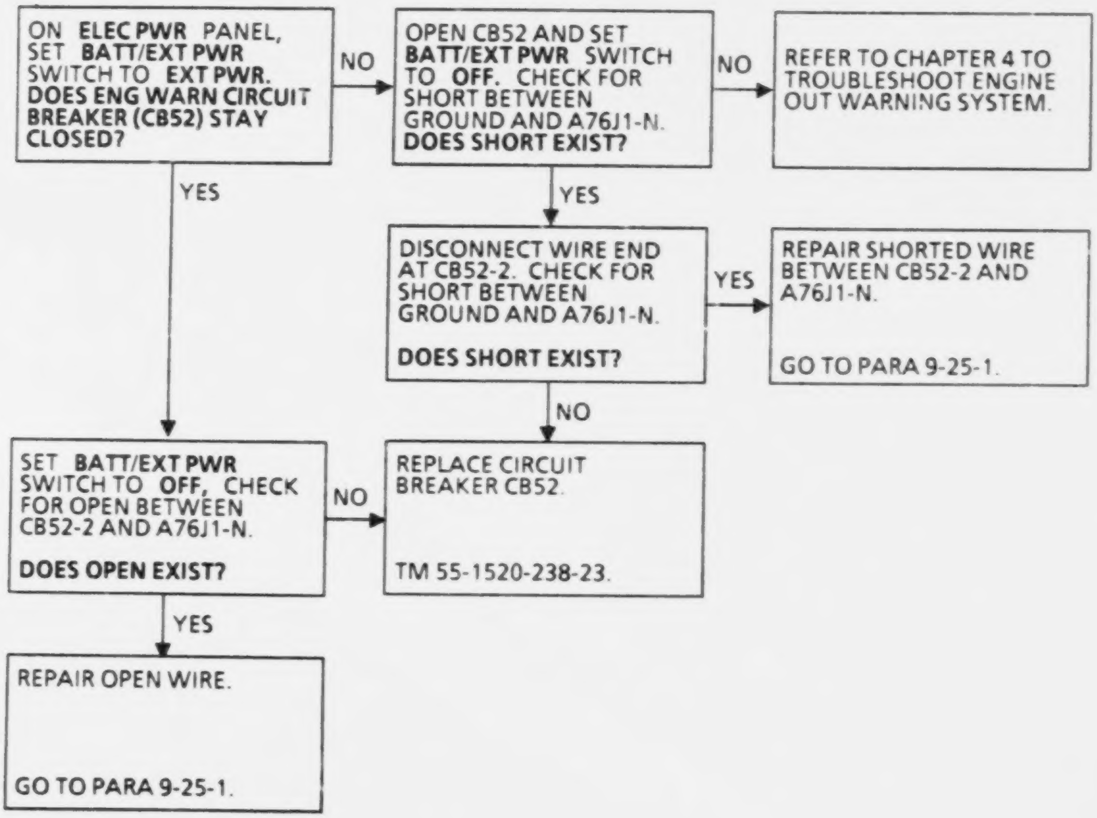
Personnel Required: (para 9-25-8)

References: (para 9-25-8)

Equipment Conditions: (para 9-25-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG WARN CIRCUIT BREAKER (CB52) STAY CLOSED?
NO
OPEN CB52 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-N. DOES SHORT EXIST?
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT ENGINE OUT WARNING SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB52-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-N. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB52-2 AND A76J1-N. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB52-2 AND A76J1-N. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB52. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-11. FUEL APU CIRCUIT BREAKER (CB9) - DOES NOT STAY CLOSED OR 28 VDC TO GROUND SERVICE UTILITY RECEPTACLE IS NOT PRESENT AT A76J1-z

Tools: (para 9-25-8)

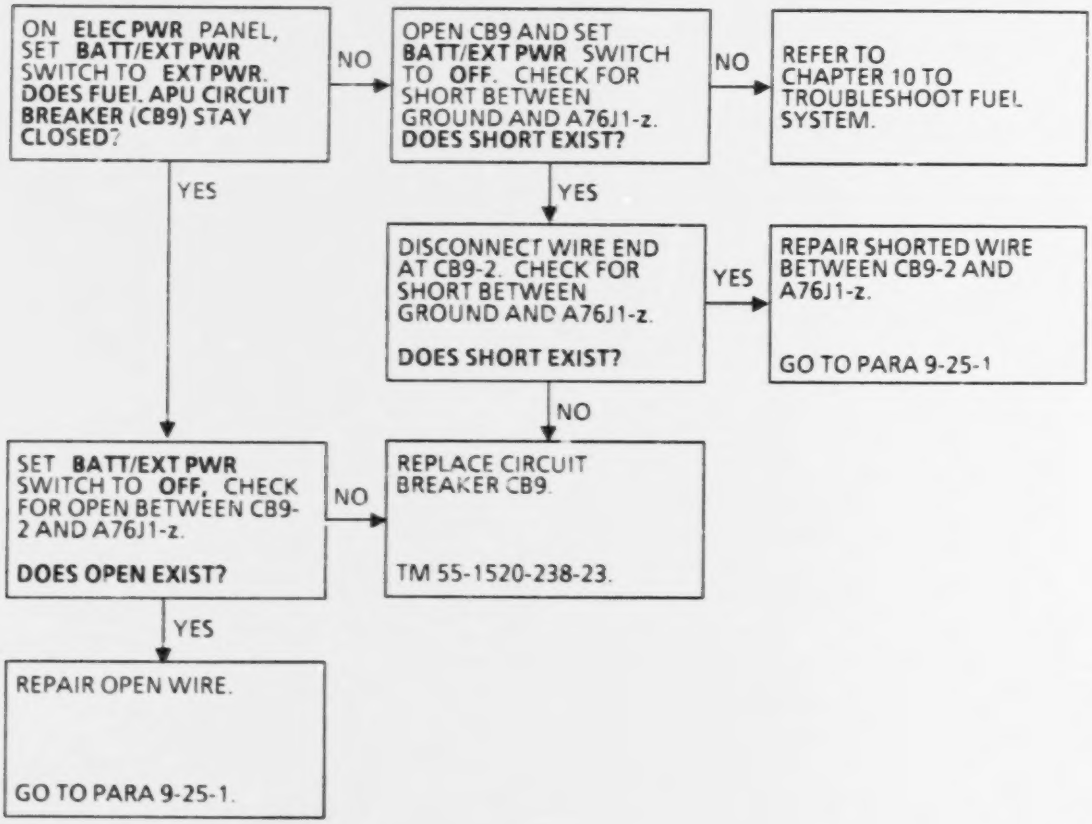
Personnel Required: (para 9-25-8)

References: (para 9-25-8)

Equipment Conditions: (para 9-25-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES FUEL APU CIRCUIT BREAKER (CB9) STAY CLOSED?**

OPEN CB9 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-z. **DOES SHORT EXIST?**

REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.

DISCONNECT WIRE END AT CB9-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-z.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB9-2 AND A76J1-z.

GO TO PARA 9-25-1

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN CB9-2 AND A76J1-z.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB9.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-12. FUEL VLV ACTR CIRCUIT BREAKER (CB14) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1-C

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

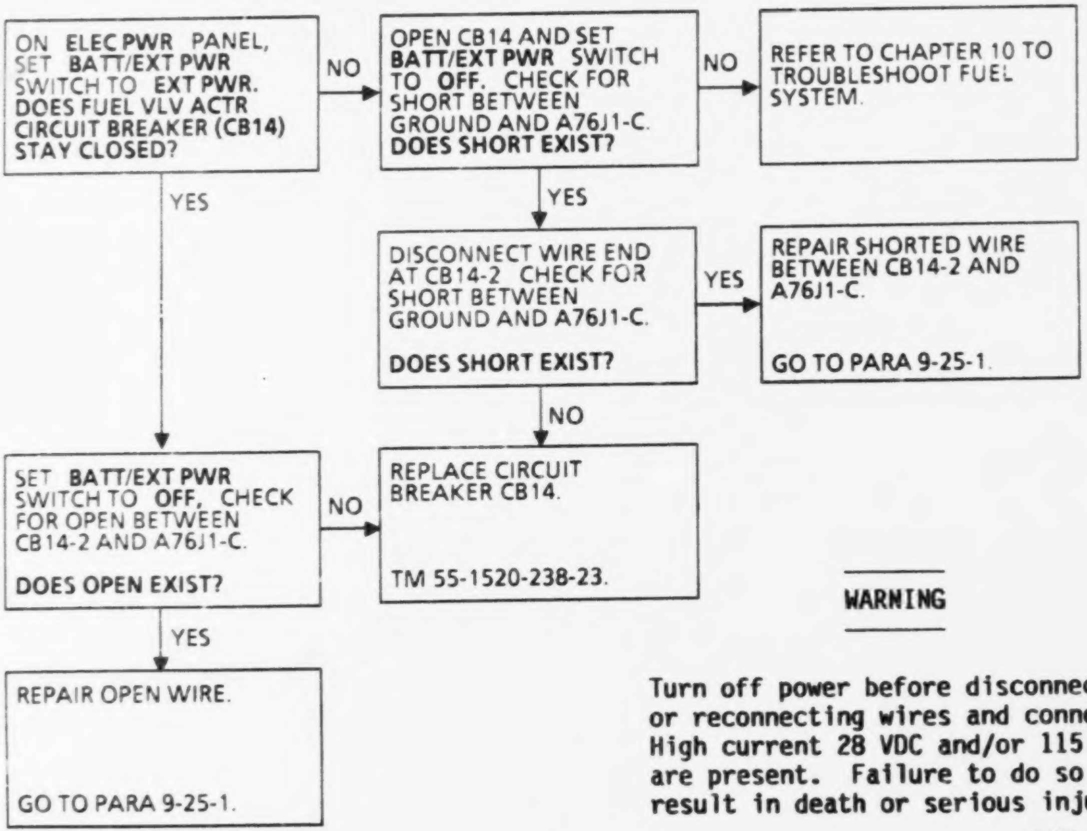
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FUEL VLV ACTR CIRCUIT BREAKER (CB14) STAY CLOSED?
NO
OPEN CB14 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-C. DOES SHORT EXIST?
NO
REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB14-2 CHECK FOR SHORT BETWEEN GROUND AND A76J1-C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB14-2 AND A76J1-C. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB14-2 AND A76J1-C. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB14. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-13. FIRE EXTGH APU CIRCUIT BREAKER (CB26 - DOES NOT STAY CLOSED OR 28 VDC TO BTL DISCHARGE/APU PANEL IS NOT PRESENT AT A76J1-J

Tools: (para 9-25-12)

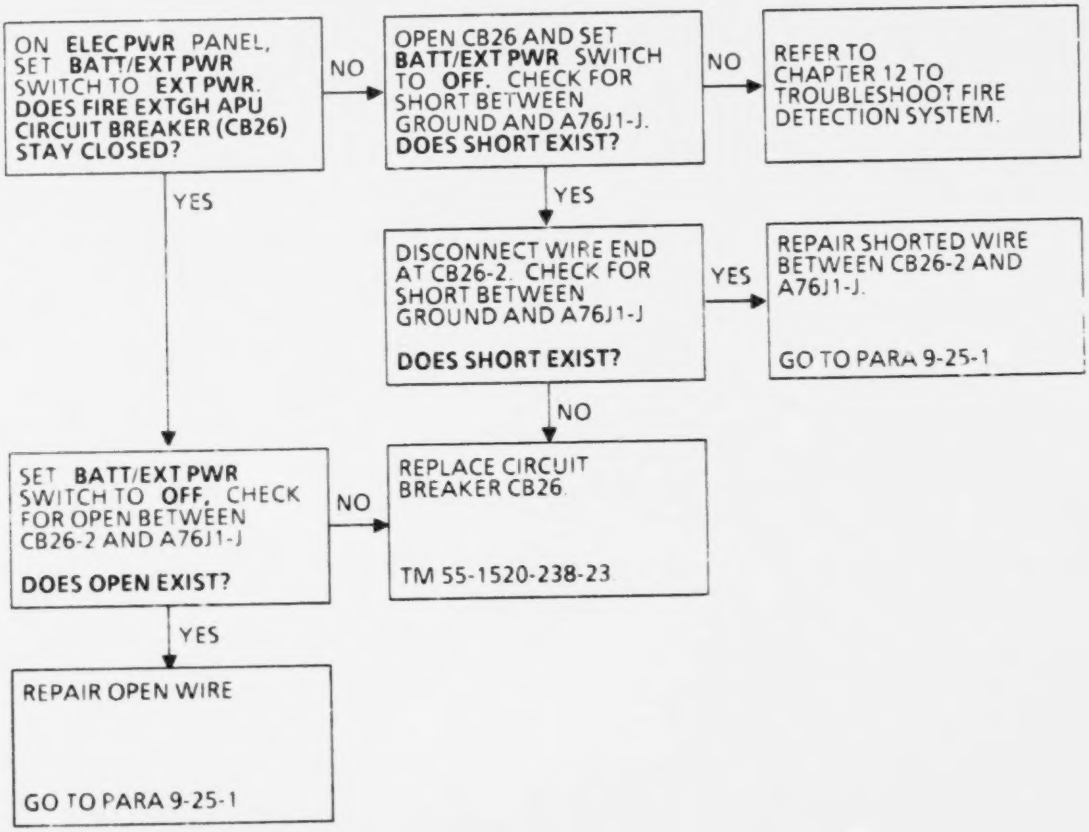
Personnel Required: (para 9-25-12)

References: (para 9-25-12)

Equipment Conditions: (para 9-25-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE EXTGH APU CIRCUIT BREAKER (CB26) STAY CLOSED?
NO
OPEN CB26 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-J. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB26-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-J
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB26-2 AND A76J1-J.
GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB26-2 AND A76J1-J
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB26.
TM 55-1520-238-23
YES
REPAIR OPEN WIRE
GO TO PARA 9-25-1

END OF TASK

9-25-14. FIRE EXTGH CPG CIRCUIT BREAKER (CB15) - DOES NOT STAY CLOSED OR 28 VDC TO CPG FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1-H

Tools: (para 9-25-12)

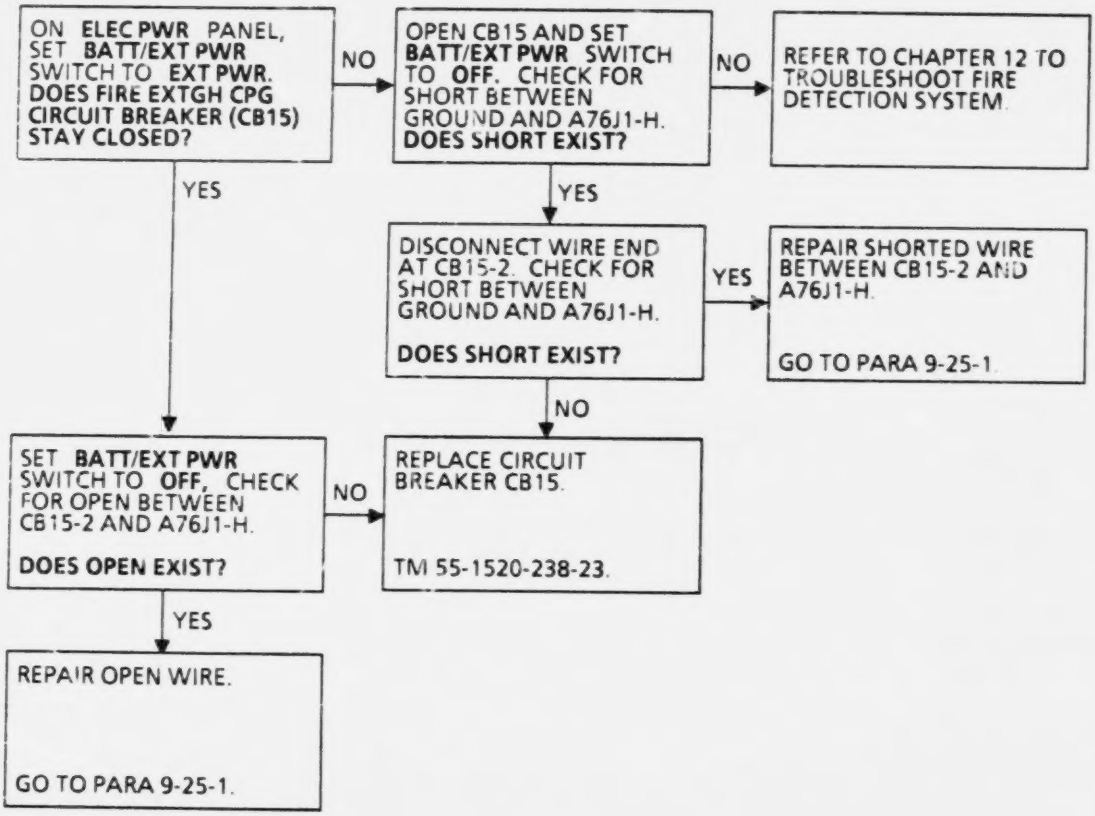
Personnel Required: (para 9-25-12)

References: (para 9-25-12)

Equipment Conditions: (para 9-25-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES FIRE EXTGH CPG CIRCUIT BREAKER (CB15) STAY CLOSED?**

OPEN CB15 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-H. **DOES SHORT EXIST?**

REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.

DISCONNECT WIRE END AT CB15-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-H.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB15-2 AND A76J1-H.

GO TO PARA 9-25-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN CB15-2 AND A76J1-H.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB15.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-15. FIRE EXTGH PLT CIRCUIT BREAKER (CB25) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1-D

Tools: (para 9-25-12)

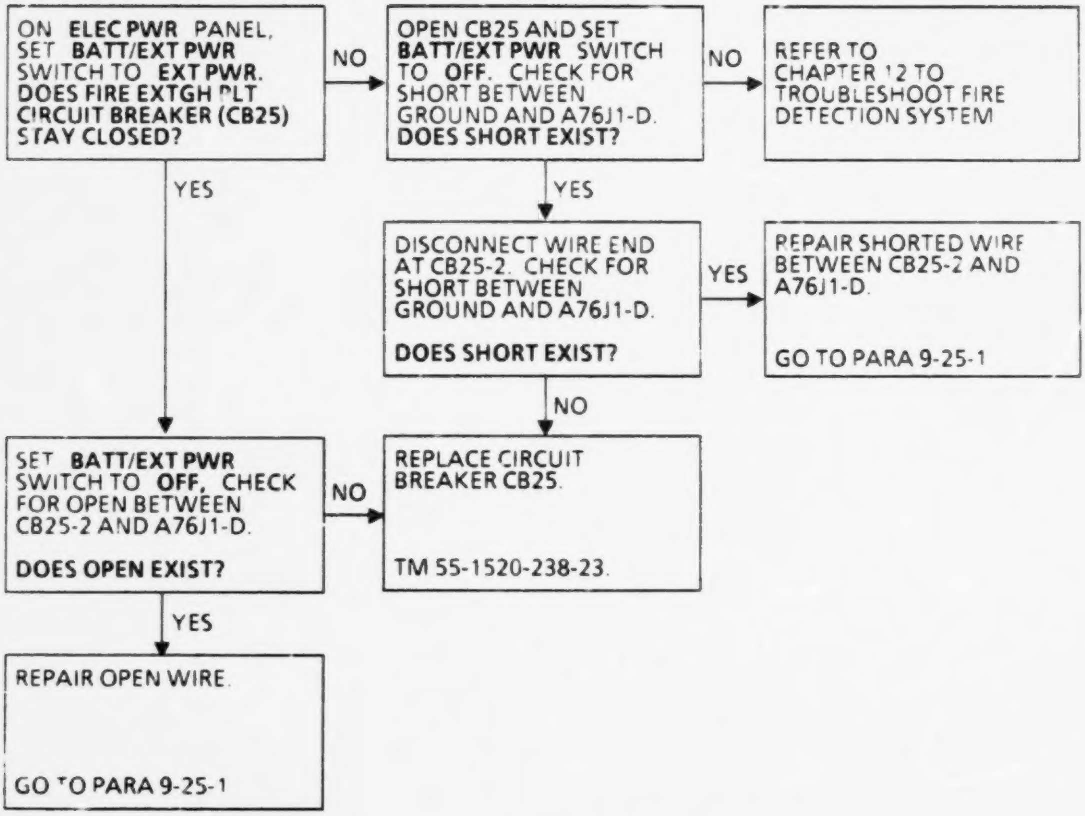
Personnel Required: (para 9-25-12)

References: (para 9-15-12)

Equipment Conditions: (para 9-25-12)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** **DOES FIRE EXTGH PLT CIRCUIT BREAKER (CB25) STAY CLOSED?**

OPEN CB25 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-D. **DOES SHORT EXIST?**

REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM

DISCONNECT WIRE END AT CB25-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-D.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB25-2 AND A76J1-D.

GO TO PARA 9-25-1

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN CB25-2 AND A76J1-D.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB25.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1

END OF TASK

9-25-16. FIRE DETR APU CIRCUIT BREAKER (CB11) - DOES NOT STAY CLOSED OR 28 VDC TO APU FLAME DETECTOR IS NOT PRESENT AT A76J1-E

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

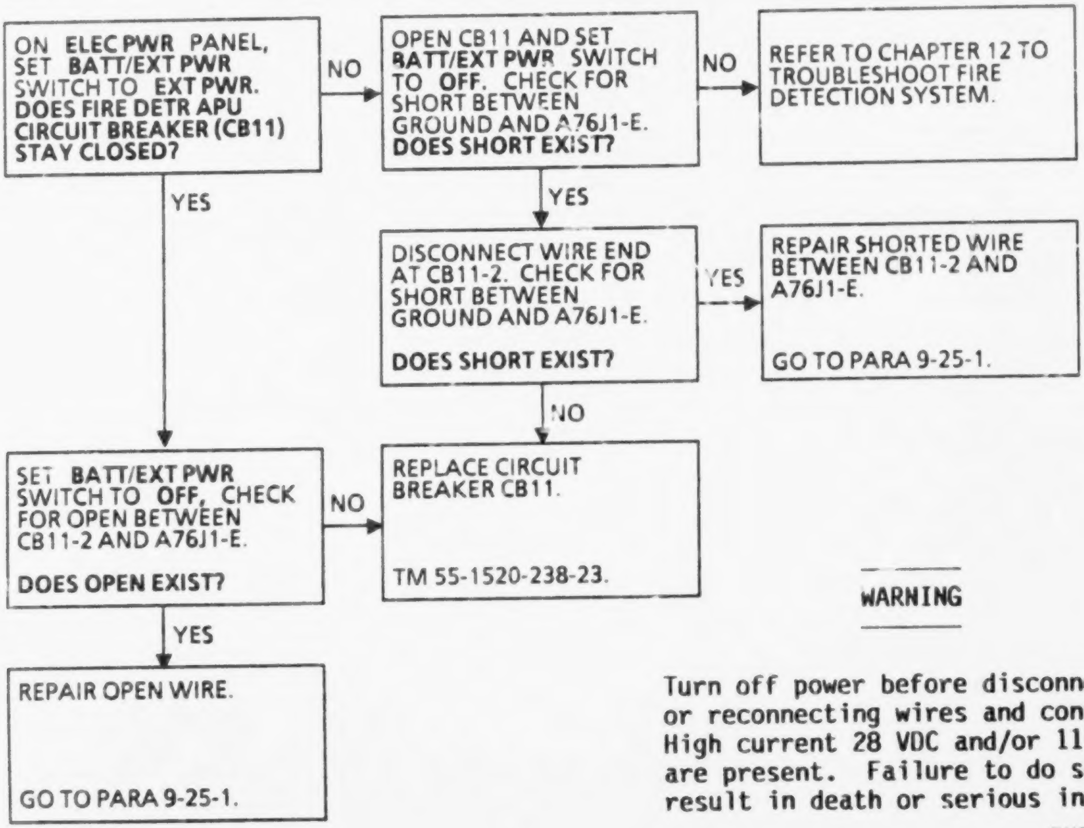
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE DETR APU CIRCUIT BREAKER (CB11) STAY CLOSED?
NO
OPEN CB11 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-E. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB11-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-E. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB11-2 AND A76J1-E. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB11-2 AND A76J1-E. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB11. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-17. FIRE DETR ENG 2 CIRCUIT BREAKER (CB13) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE 2 FLAME DETECTOR IS NOT PRESENT AT A76J1-G

Tools: (para 9-25-16)

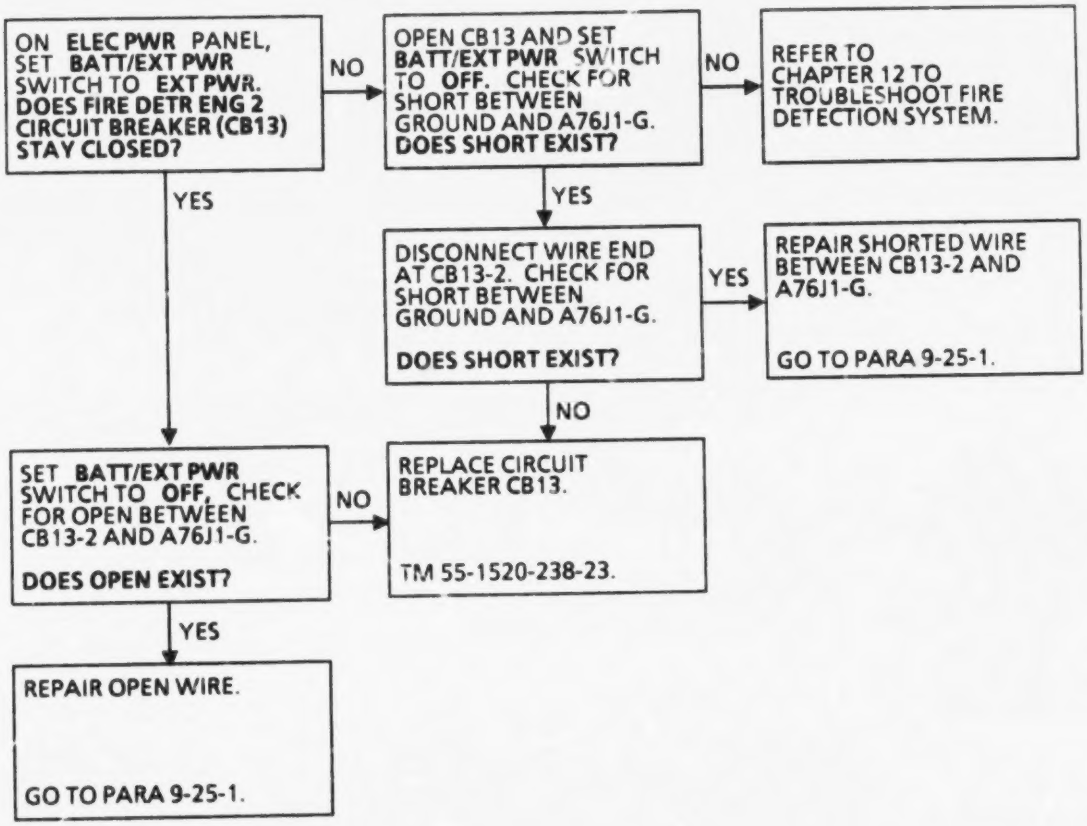
Personnel Required: (para 9-25-16)

References: (para 9-25-16)

Equipment Conditions: (para 9-25-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE DETR ENG 2 CIRCUIT BREAKER (CB13) STAY CLOSED?
NO
OPEN CB13 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-G. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB13-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-G. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB13-2 AND A76J1-G. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB13-2 AND A76J1-G. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB13. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-18. FIRE DETR ENG 1 CIRCUIT BREAKER (CB12) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE 1 FLAME DETECTOR IS NOT PRESENT AT A76J1-F

Tools: (para 9-25-16)

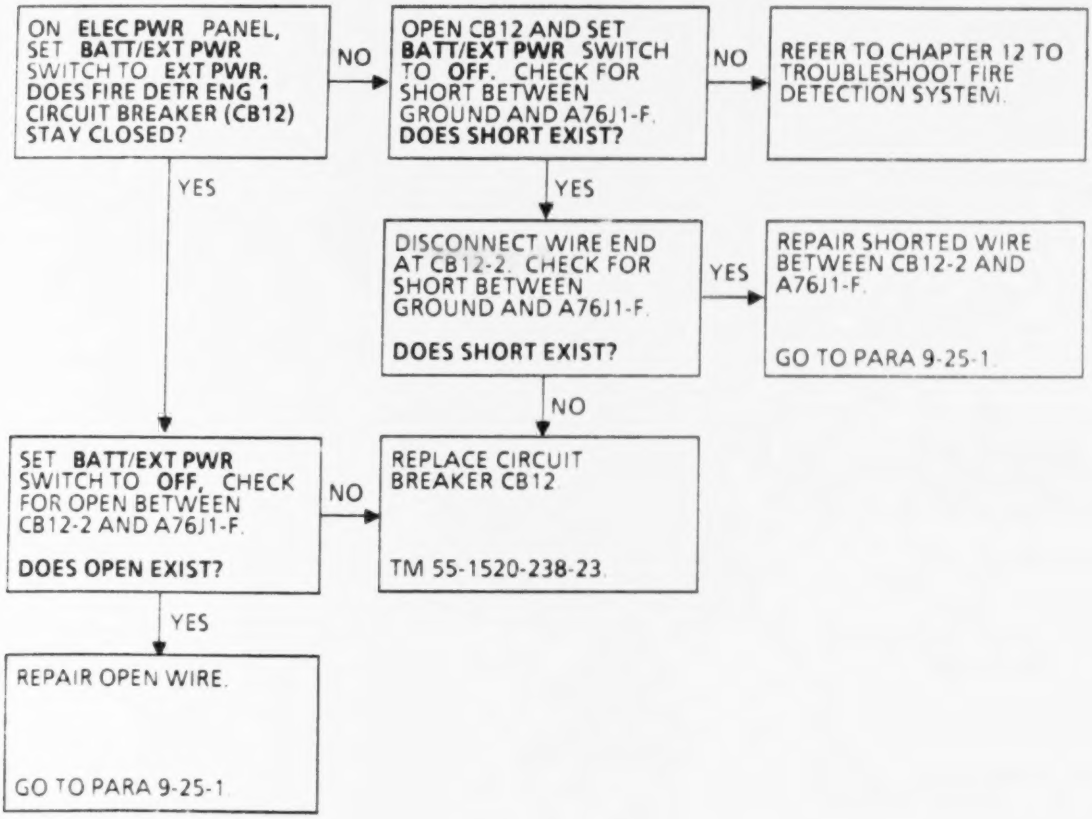
Personnel Required: (para 9-25-16)

References: (para 9-25-16)

Equipment Conditions: (para 9-25-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES FIRE DETR ENG 1 CIRCUIT BREAKER (CB12) STAY CLOSED?
NO
OPEN CB12 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-F. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB12-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-F. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB12-2 AND A76J1-F. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB12-2 AND A76J1-F. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB12. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-19. ENG INST CIRCUIT BREAKER (CB17) - DOES NOT STAY CLOSED OR 28 VDC TO SIGNAL DATA CONVERTER IS NOT PRESENT AT A76J1-L, -M

Tools: (para 9-25-16)

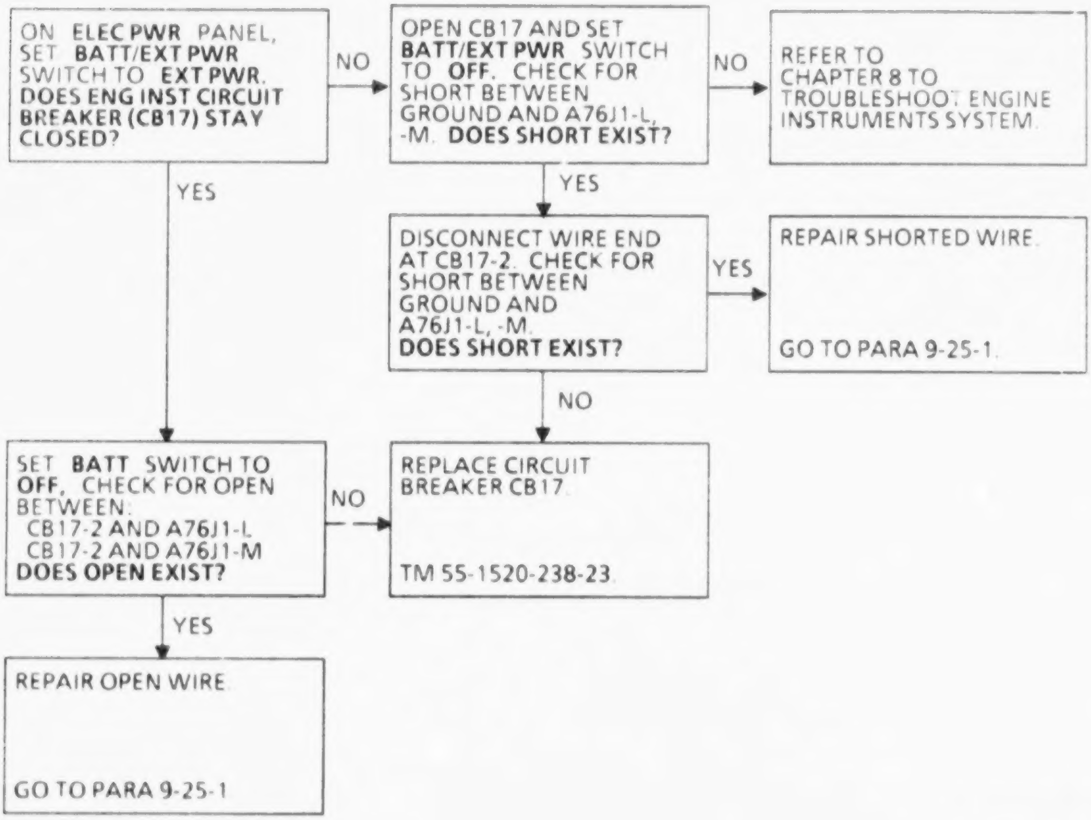
Personnel Required: (para 9-25-16)

References: (para 9-25-16)

Equipment Conditions: (para 9-25-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG INST CIRCUIT BREAKER (CB17) STAY CLOSED?
NO
OPEN CB17 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-L, -M. DOES SHORT EXIST?
NO
REFER TO CHAPTER 8 TO TROUBLESHOOT ENGINE INSTRUMENTS SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB17-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-L, -M. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-25-1.
NO
SET BATT SWITCH TO OFF. CHECK FOR OPEN BETWEEN: CB17-2 AND A76J1-L CB17-2 AND A76J1-M DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB17.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1

END OF TASK

9-25-20. ENG START CIRCUIT BREAKER (CB58) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT POWER QUADRANT IS NOT PRESENT AT A76J1-c, -X

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

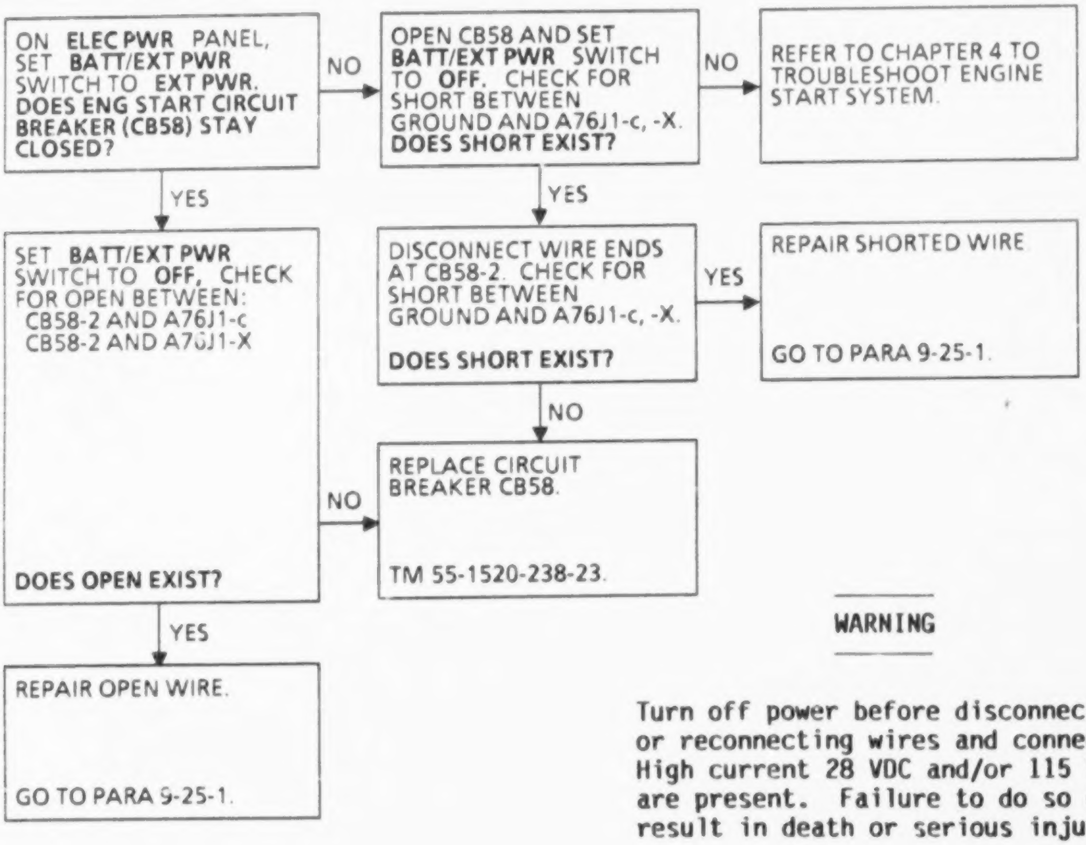
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES ENG START CIRCUIT BREAKER (CB58) STAY CLOSED?**

OPEN CB58 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-c, -X. **DOES SHORT EXIST?**

REFER TO CHAPTER 4 TO TROUBLESHOOT ENGINE START SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN:
CB58-2 AND A76J1-c
CB58-2 AND A76J1-X
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB58-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-c, -X.
DOES SHORT EXIST?

REPAIR SHORTED WIRE
GO TO PARA 9-25-1.

REPLACE CIRCUIT BREAKER CB58.
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-21. ENG LVR CIRCUIT BREAKER (CB16) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT FIRE EXTINGUISH PANEL IS NOT PRESENT AT A76J1 -K

Tools: (para 9-25-20)

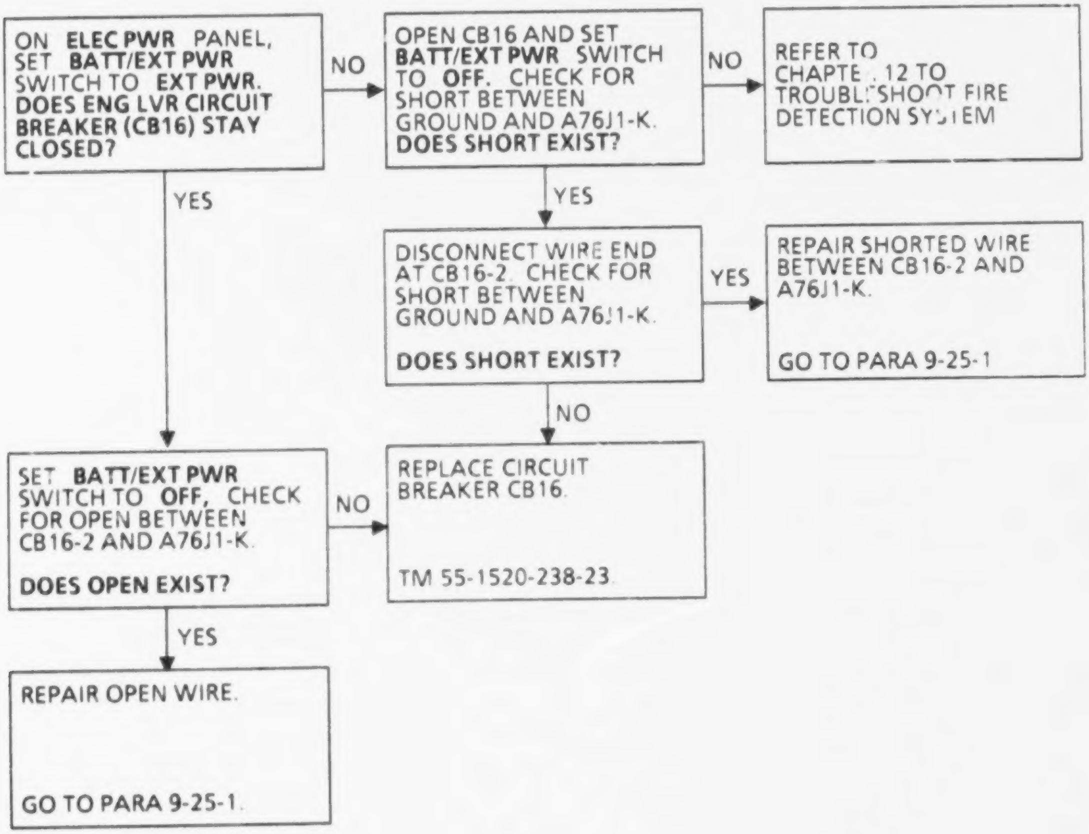
Personnel Required: (para 9-25-20)

References: (para 9-25-20)

Equipment Conditions: (para 9-25-20)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG LVR CIRCUIT BREAKER (CB16) STAY CLOSED?
NO
OPEN CB16 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-K. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT FIRE DETECTION SYSTEM
YES
YES
DISCONNECT WIRE END AT CB16-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-K. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB16-2 AND A76J1-K. GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB16-2 AND A76J1-K. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB16. TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-22. ENG CUT CIRCUIT BREAKER (CB60) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG COLLECTIVE STICKS IS NOT PRESENT AT A76J1-b

Tools: (para 9-25-20)

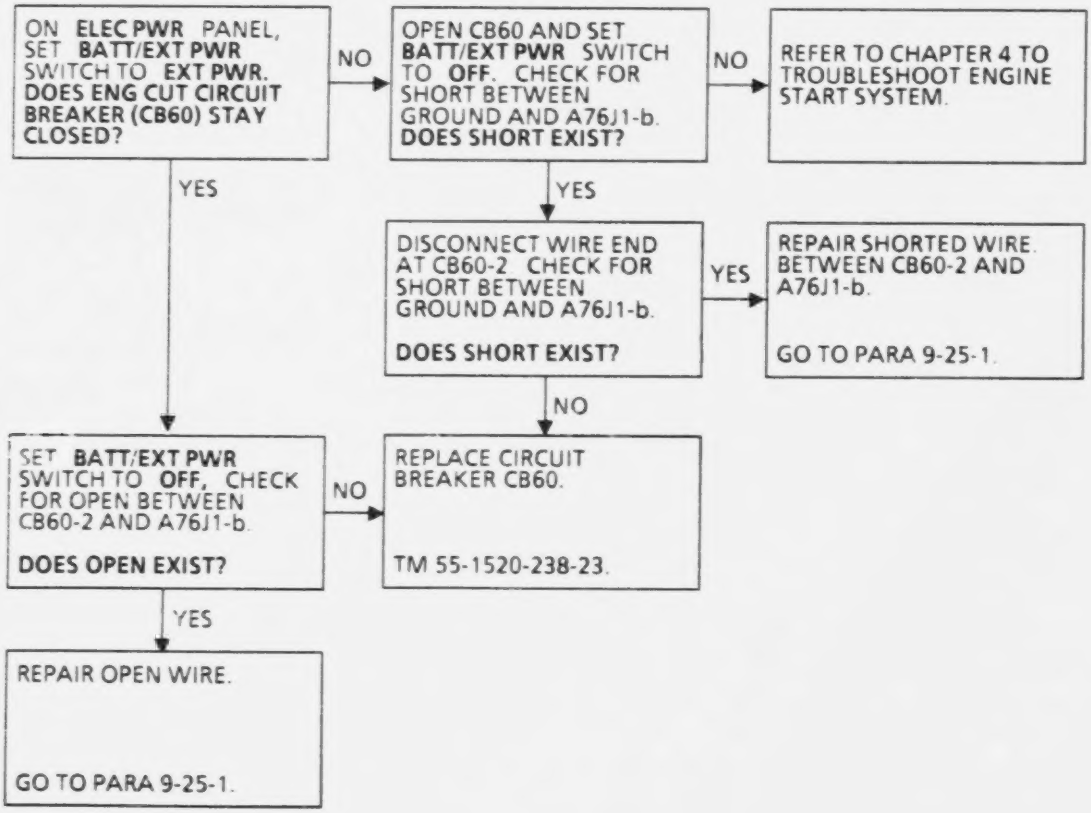
Personnel Required: (para 9-25-20)

References: (para 9-25-20)

Equipment Conditions: (para 9-25-20)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG CUT CIRCUIT BREAKER (CB60) STAY CLOSED?
NO
OPEN CB60 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-b. DOES SHORT EXIST?
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT ENGINE START SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB60-2 CHECK FOR SHORT BETWEEN GROUND AND A76J1-b. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. BETWEEN CB60-2 AND A76J1-b. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB60-2 AND A76J1-b. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB60. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-23. THROT CIRCUIT BREAKER (CB8) - DOES NOT STAY CLOSED OR 28 VDC TO CPG POWER QUADRANT PANEL IS NOT PRESENT AT A76J1-d

Tools: (para 9-25-20)

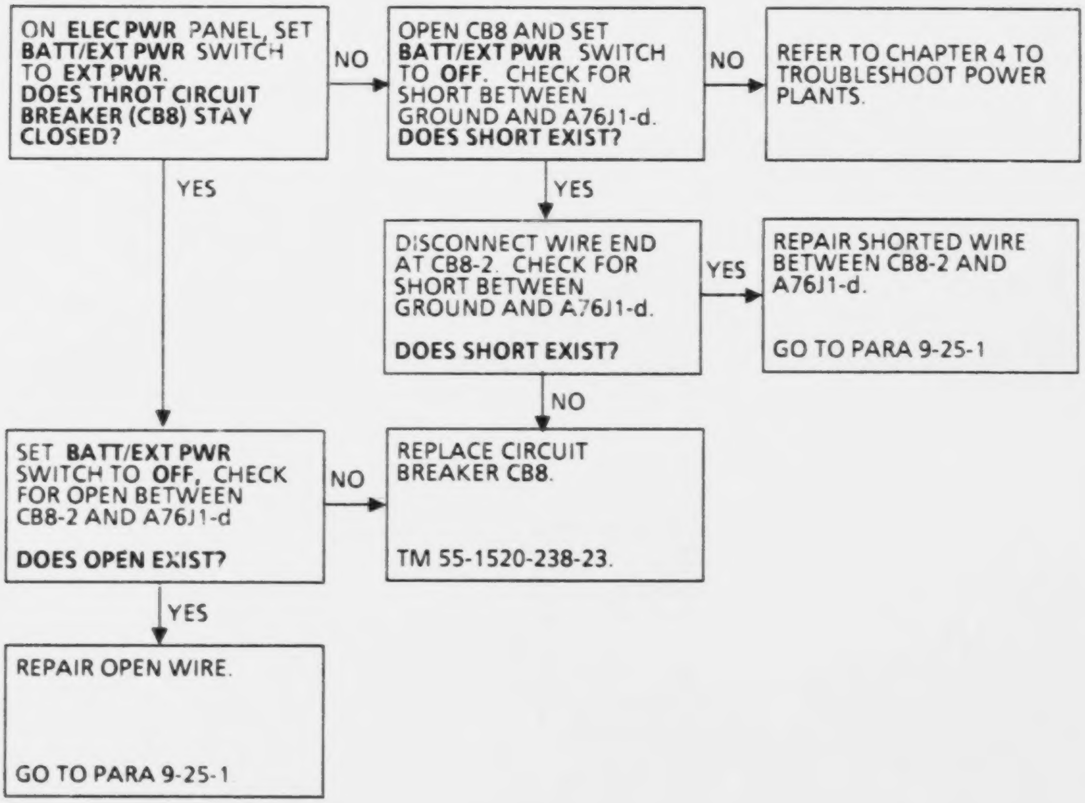
Personnel Required: (para 9-25-20)

References: (para 9-25-20

Equipment Conditions: (para 9-25-20)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES THROT CIRCUIT BREAKER (CB8) STAY CLOSED?**
NO
OPEN CB8 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-d. **DOES SHORT EXIST?**
NO
REFER TO CHAPTER 4 TO TROUBLESHOOT POWER PLANTS.
YES
YES
DISCONNECT WIRE END AT CB8-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-d.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB8-2 AND A76J1-d.
GO TO PARA 9-25-1
NO
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN CB8-2 AND A76J1-d
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB8.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1

END OF TASK

9-25-24. STBY ATTD CIRCUIT BREAKER (CB19) - DOES NOT STAY CLOSED OR 28 VDC TO STANDBY ATTITUDE INDICATOR IS NOT PRESENT AT A76J1-e

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

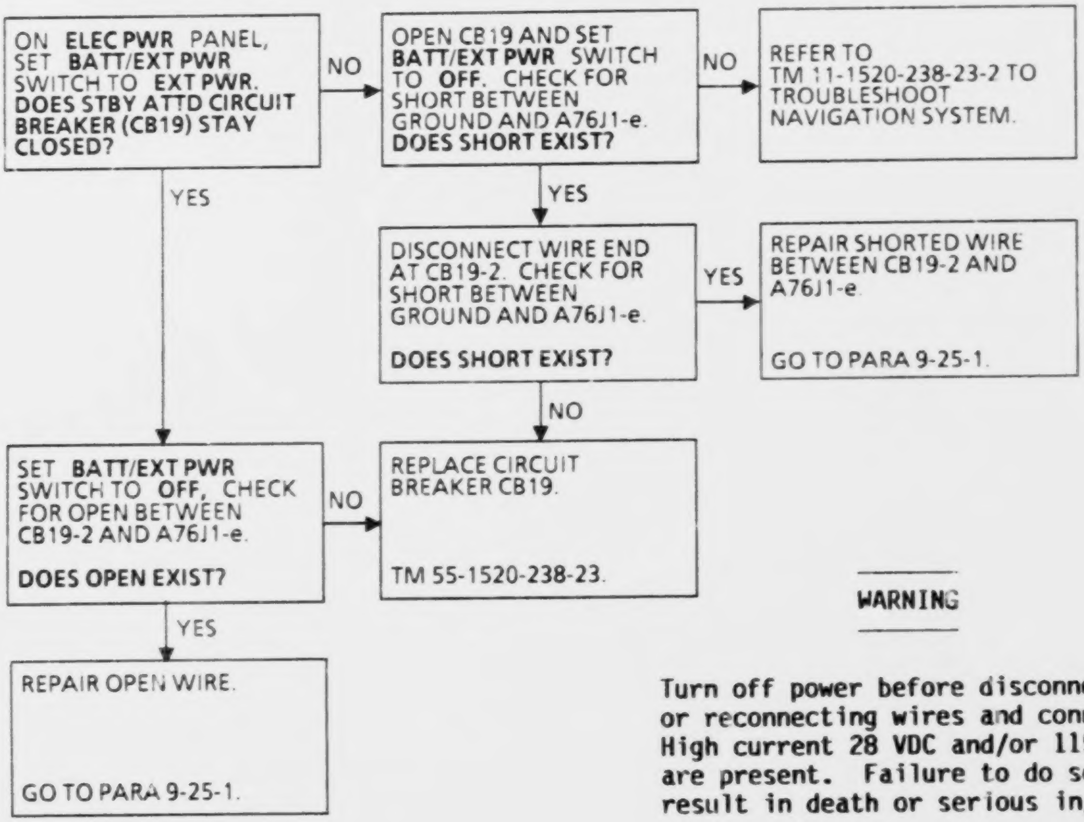
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES STBY ATTD CIRCUIT BREAKER (CB19) STAY CLOSED?**

OPEN CB19 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-e. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT NAVIGATION SYSTEM.

DISCONNECT WIRE END AT CB19-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-e.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB19-2 AND A76J1-e.

GO TO PARA 9-25-1.

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN CB19-2 AND A76J1-e.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB19.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-25. RDR ALT CIRCUIT BREAKER (CB31) - DOES NOT STAY CLOSED OR 28 VDC TO RADAR ALTIMETER RECEIVER AND TRANSMITTER IS NOT PRESENT AT A76J1-f, -g

Tools: (para 9-25-24)

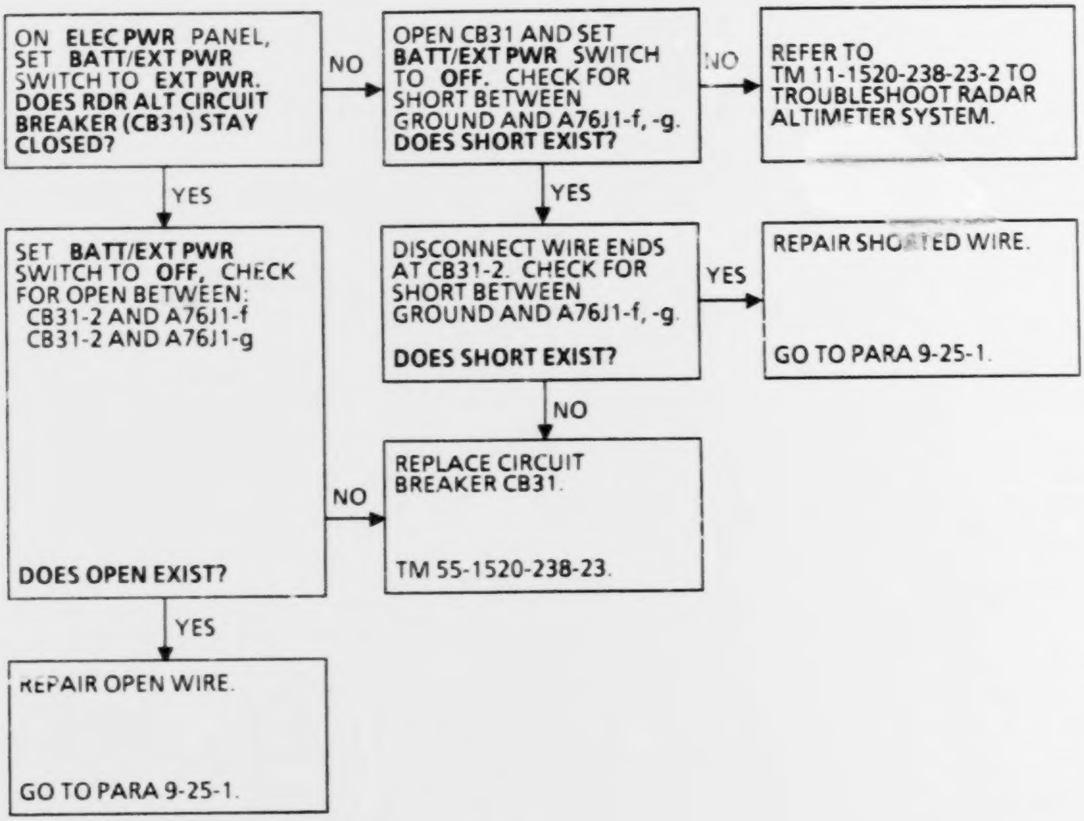
Personnel Required: (para 9-25-24)

References: (para 9-25-24)

Equipment Conditions: (para 9-25-24)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES RDR ALT CIRCUIT BREAKER (CB31) STAY CLOSED?**

OPEN CB31 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-f, -g. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR ALTIMETER SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN:
CB31-2 AND A76J1-f
CB31-2 AND A76J1-g

DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB31-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-f, -g.

DOES SHORT EXIST?

REPAIR SHORTED WIRE.

GO TO PARA 9-25-1.

REPLACE CIRCUIT BREAKER CB31.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-26. TRIM CIRCUIT BREAKER (CB87) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG CYCLIC STICKS IS NOT PRESENT AT A76J1-Y, -Z

Tools: (para 9-25-24)

Personnel Required: (para 9-25-24)

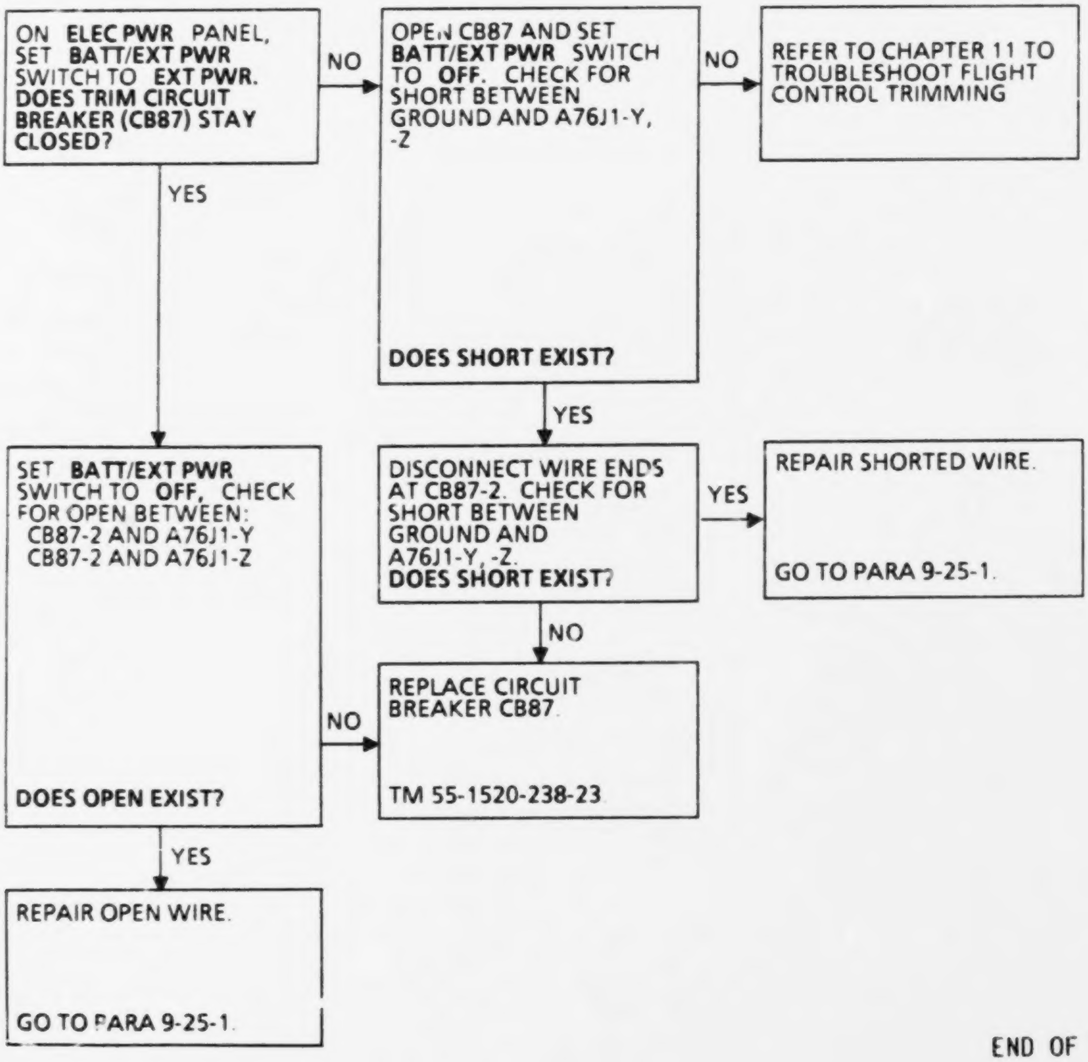
References:

TM 55-1520-238-23

Equipment Conditions: (para 9-25-24)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES TRIM CIRCUIT BREAKER (CB87) STAY CLOSED?
NO
OPEN CB87 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-Y, -Z
DOES SHORT EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT FLIGHT CONTROL TRIMMING
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB87-2 AND A76J1-Y CB87-2 AND A76J1-Z
DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB87-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-Y, -Z. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB87.
TM 55-1520-238-23
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-27. EMERG HYD CIRCUIT BREAKER (CB35) - DOES NOT STAY CLOSED OR 28 VDC TO PRIMARY AND UTILITY HYDRAULIC MANIFOLDS IS NOT PRESENT AT A76J1-k, -m

Tools: (para 9-25-24)

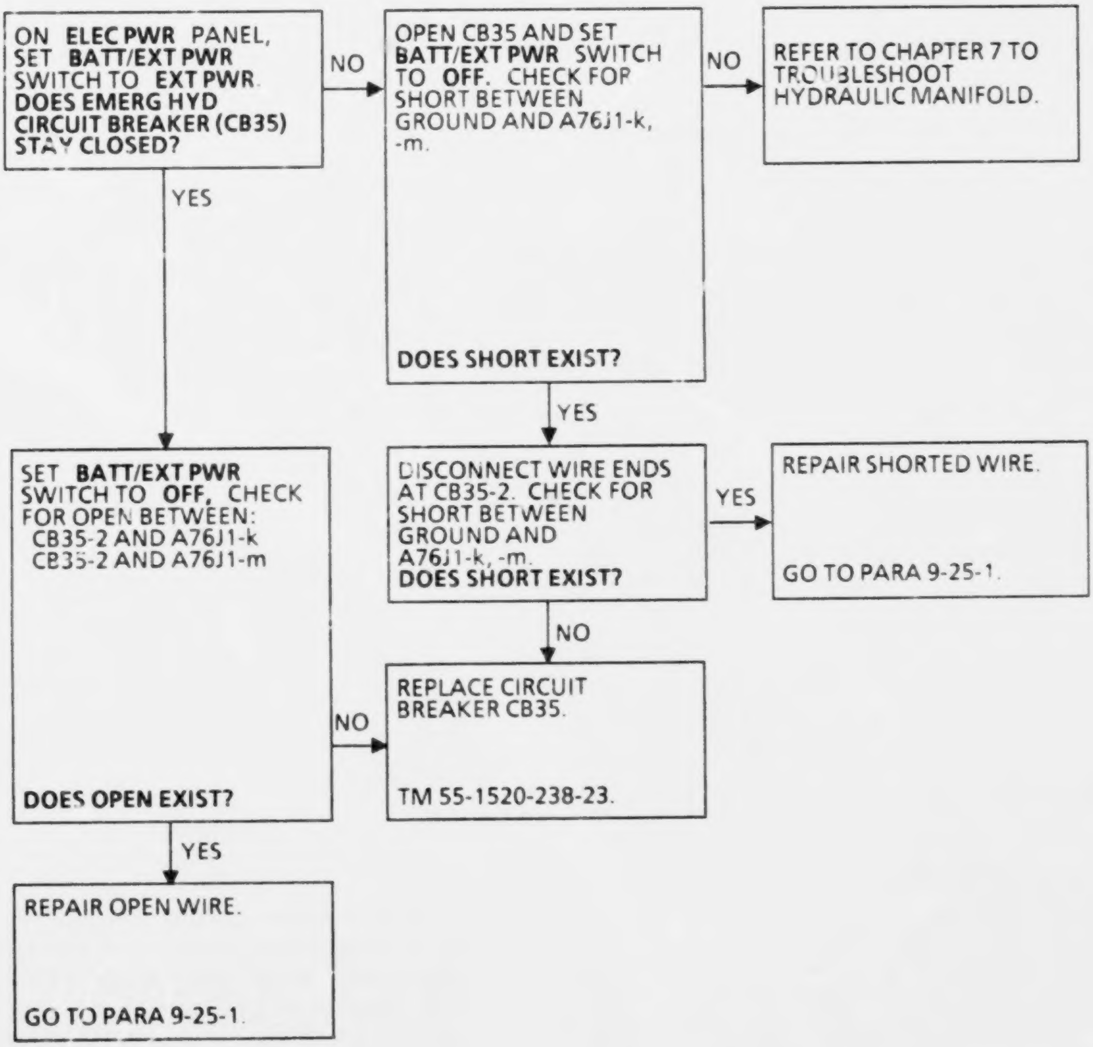
Personnel Required: (para 9-25-24)

References: (para 9-25-26)

Equipment Conditions: (para 9-25-24)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES EMERG HYD CIRCUIT BREAKER (CB35) STAY CLOSED?**
NO
OPEN CB35 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-k, -m. **DOES SHORT EXIST?**
NO
REFER TO CHAPTER 7 TO TROUBLESHOOT HYDRAULIC MANIFOLD.
YES
YES
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN: CB35-2 AND A76J1-k CB35-2 AND A76J1-m **DOES OPEN EXIST?**
DISCONNECT WIRE ENDS AT CB35-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-k, -m. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE. GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB35. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-28. LT UTIL SEC CIRCUIT BREAKER (CB23) - DOES NOT STAY CLOSED OR 28 VDC TO UTILITY LIGHTS IS NOT PRESENT AT A76J1-U, -W

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

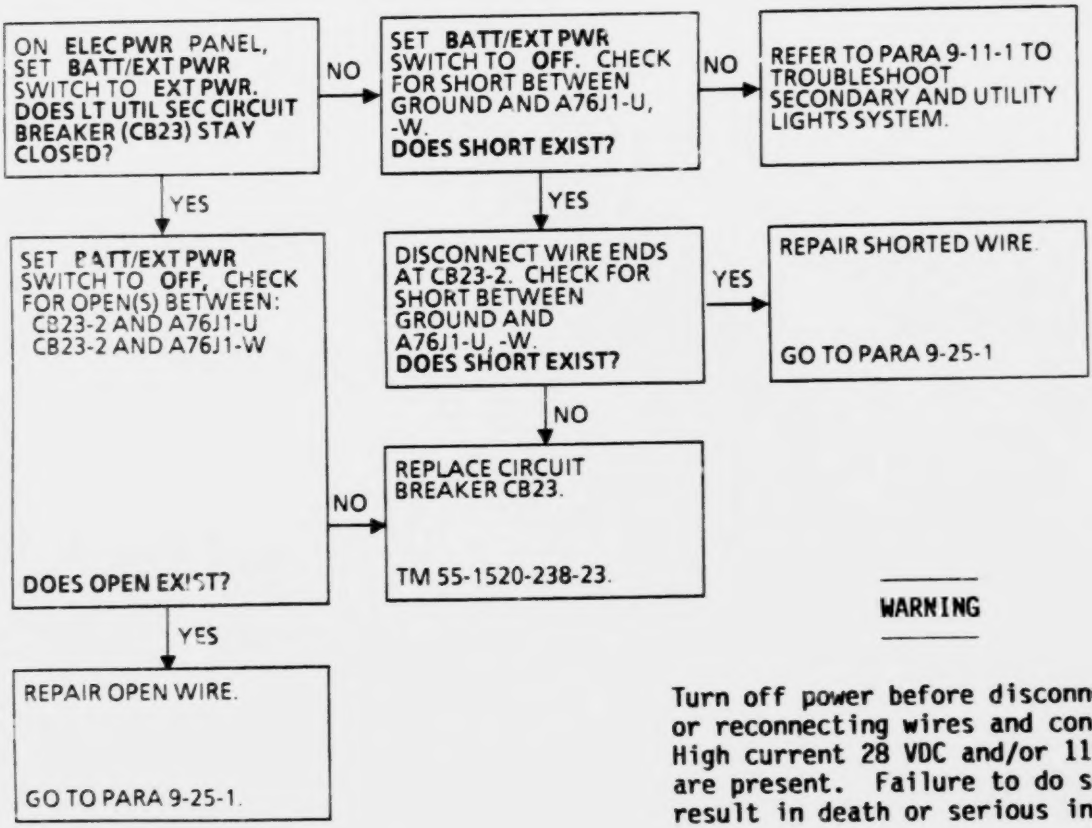
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT UTIL SEC CIRCUIT BREAKER (CB23) STAY CLOSED?
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-U, -W. DOES SHORT EXIST?
NO
REFER TO PARA 9-11-1 TO TROUBLESHOOT SECONDARY AND UTILITY LIGHTS SYSTEM.
YES
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN(S) BETWEEN: CB23-2 AND A76J1-U CB23-2 AND A76J1-W DOES OPEN EXIST?
DISCONNECT WIRE ENDS AT CB23-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-U, -W. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE. GO TO PARA 9-25-1
NO
NO
REPLACE CIRCUIT BREAKER CB23. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-29. LT SRCH/LDG CONT CIRCUIT BREAKER (CB80) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT AND CPG COLLECTIVE STICKS SEARCH LIGHT CONTROL IS NOT PRESENT AT A76J1-V

Tools: (para 9-25-28)

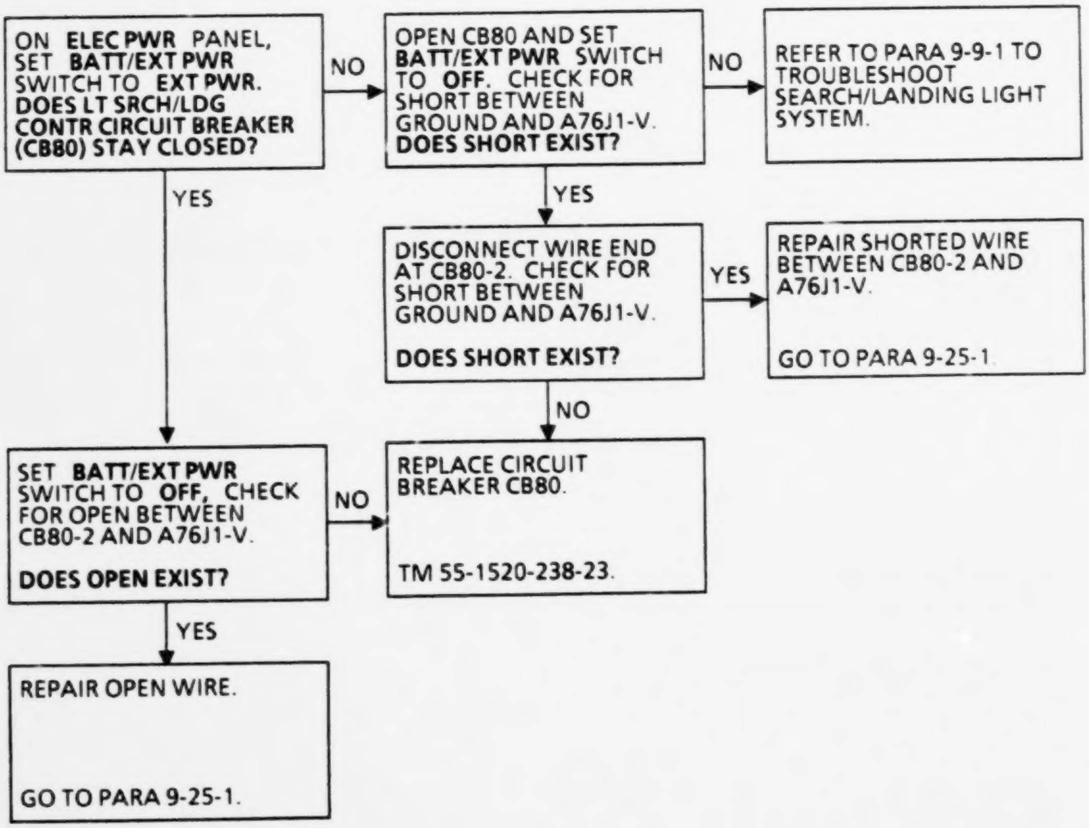
Personnel Required: (para 9-25-28)

References: (para 9-25-28)

Equipment Conditions: (para 9-25-28)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES LT SRCH/LDG CONTR CIRCUIT BREAKER (CB80) STAY CLOSED?
NO
OPEN CB80 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-V. DOES SHORT EXIST?
NO
REFER TO PARA 9-9-1 TO TROUBLESHOOT SEARCH/LANDING LIGHT SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB80-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-V. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB80-2 AND A76J1-V. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB80-2 AND A76J1-V. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB80. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TA

9-25-30. LT CAUT CIRCUIT BREAKER (CB21) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT MASTER AND CAUTION/WARNING PANELS IS NOT PRESENT AT A76J1-y

Tools: (para 9-25-28)

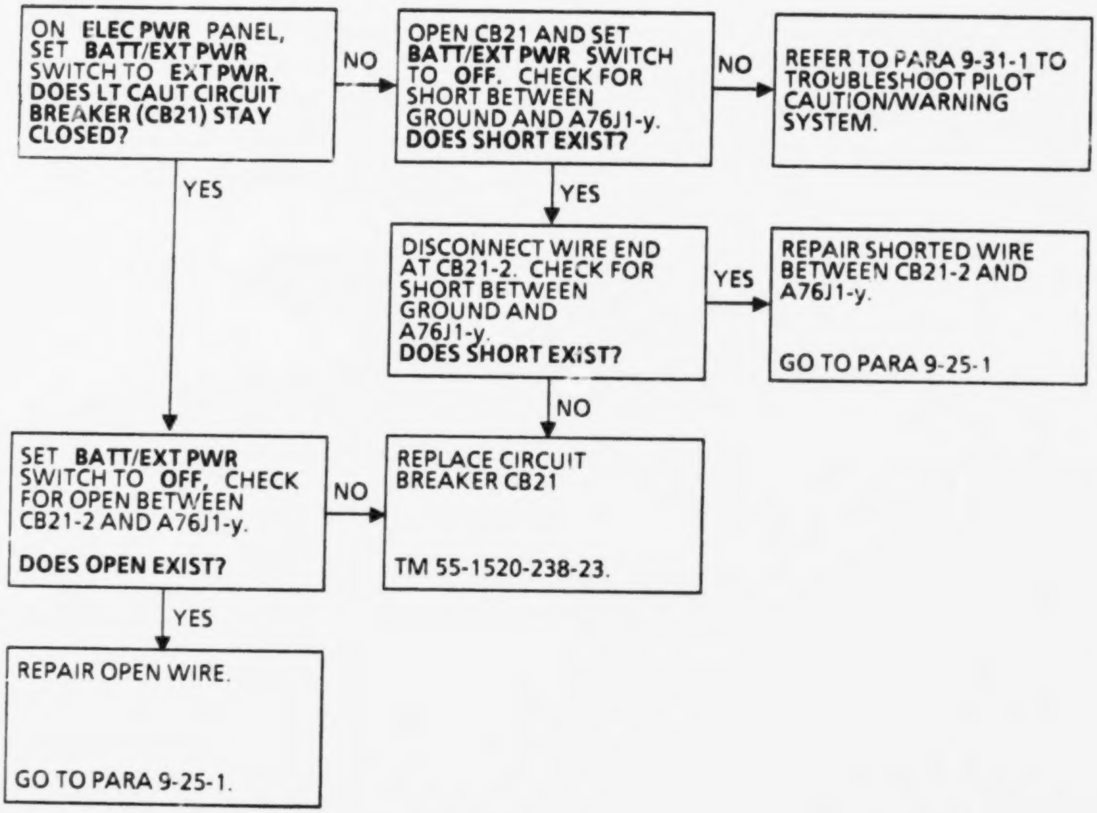
Personnel Required: (para 9-25-28)

References: (para 9-25-28)

Equipment Conditions: (para 9-25-28)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES LT CAUT CIRCUIT BREAKER (CB21) STAY CLOSED?**
NO
OPEN CB21 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-y. **DOES SHORT EXIST?**
NO
REFER TO PARA 9-31-1 TO TROUBLESHOOT PILOT CAUTION/WARNING SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB21-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-y. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE BETWEEN CB21-2 AND A76J1-y. GO TO PARA 9-25-1
NO
SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN CB21-2 AND A76J1-y. **DOES OPEN EXIST?**
NO
REPLACE CIRCUIT BREAKER CB21 TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-31. CHAFF CIRCUIT BREAKER (CB46) - DOES NOT STAY CLOSED OR 28 VDC TO CHAFF DISPENSE CONTROL PANEL IS NOT PRESENT AT A76J1-t

Tools: (para 9-25-28)

Personnel Required: (para 9-25-28)

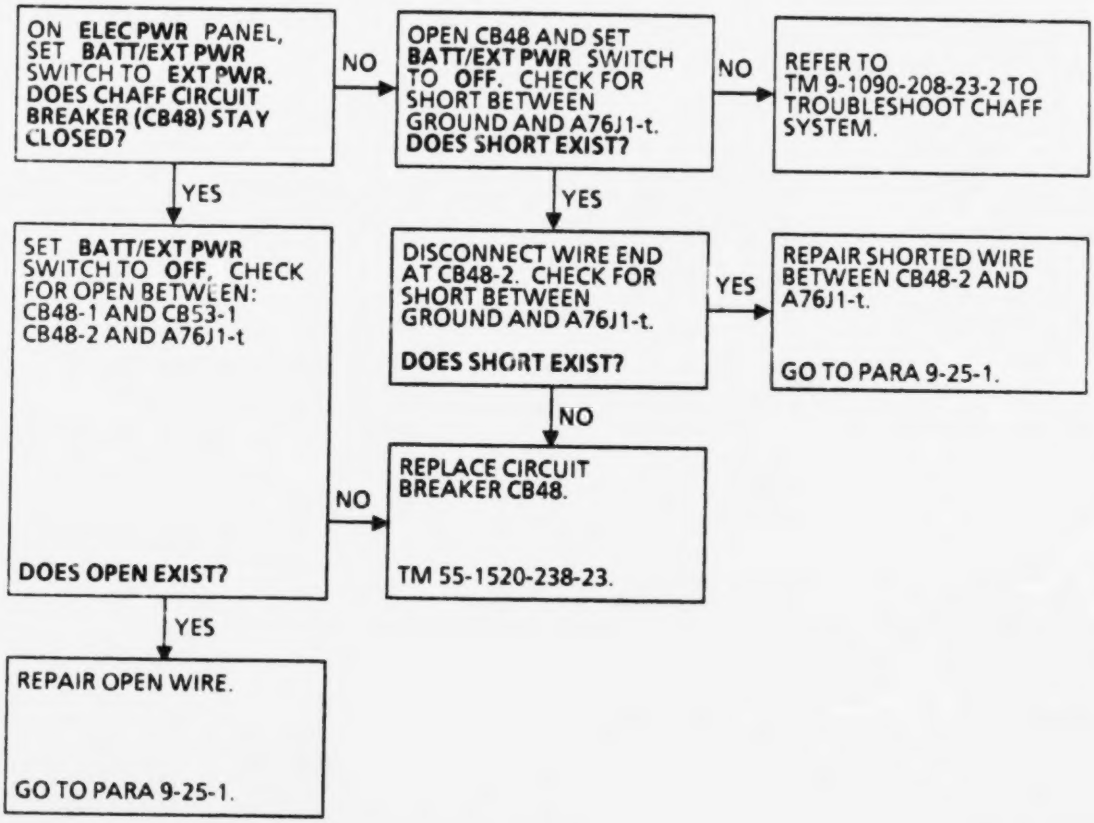
References:

TM 55-1520-238-23
TM 9-1090-208-23-2

Equipment Conditions: (para 9-25-28)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES CHAFF CIRCUIT BREAKER (CB48) STAY CLOSED?
NO
OPEN CB48 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-t. DOES SHORT EXIST?
NO
REFER TO TM 9-1090-208-23-2 TO TROUBLESHOOT CHAFF SYSTEM.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN: CB48-1 AND CB53-1 CB48-2 AND A76J1-t DOES OPEN EXIST?
YES
DISCONNECT WIRE END AT CB48-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-t. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB48-2 AND A76J1-t. GO TO PARA 9-25-1.
NO
NO
REPLACE CIRCUIT BREAKER CB48. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-32. RTR BRK CIRCUIT BREAKER (CB37) - DOES NOT STAY CLOSED OR 28 VDC TO ROTOR BRAKE PRESSURE SWITCH IS NOT PRESENT AT A76J1-n

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

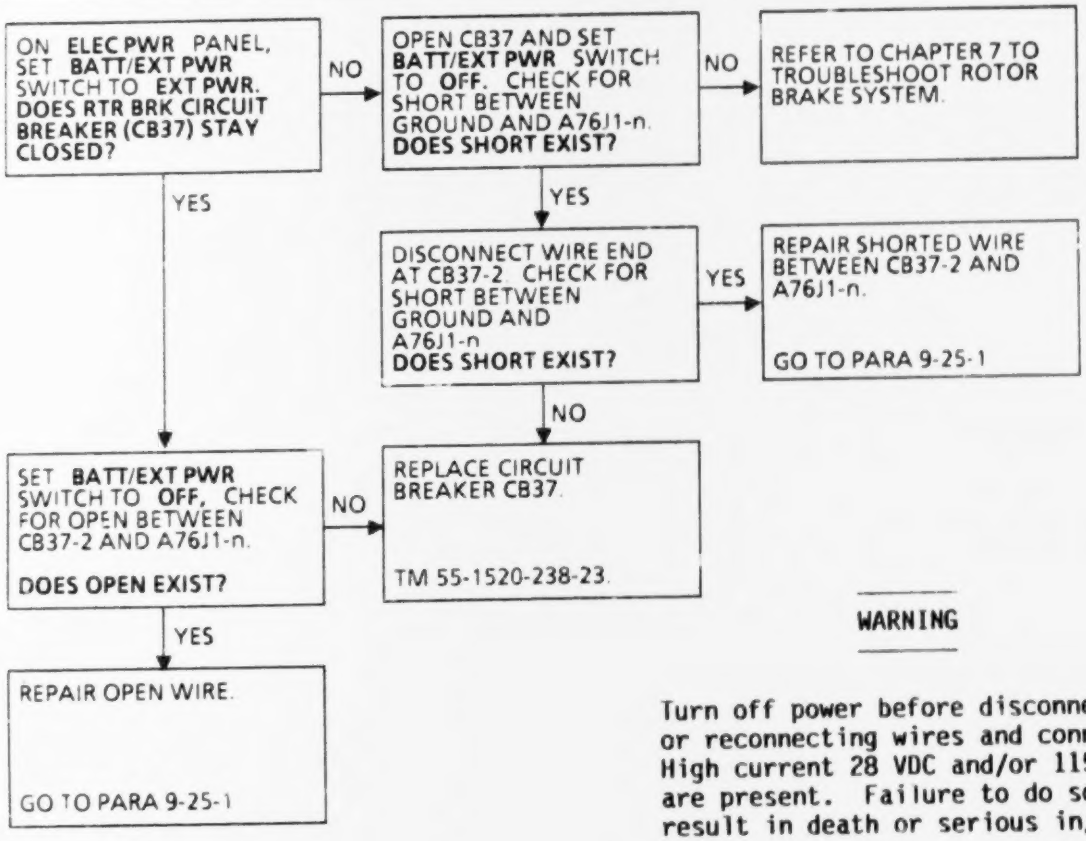
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** **DOES RTR BRK CIRCUIT BREAKER (CB37) STAY CLOSED?**

OPEN CB37 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-n. **DOES SHORT EXIST?**

REFER TO CHAPTER 7 TO TROUBLESHOOT ROTOR BRAKE SYSTEM.

DISCONNECT WIRE END AT CB37-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-n **DOES SHORT EXIST?**

REPAIR SHORTED WIRE BETWEEN CB37-2 AND A76J1-n.

GO TO PARA 9-25-1

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN CB37-2 AND A76J1-n.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB37.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-33. RDR WARN CIRCUIT BREAKER (CB53) - DOES NOT STAY CLOSED OR 28 VDC TO RADAR WARNING DETECTING SET CONTROL IS NOT PRESENT AT A76J1-q

Tools: (para 9-25-32)

Personnel Required: (para 9-25-32)

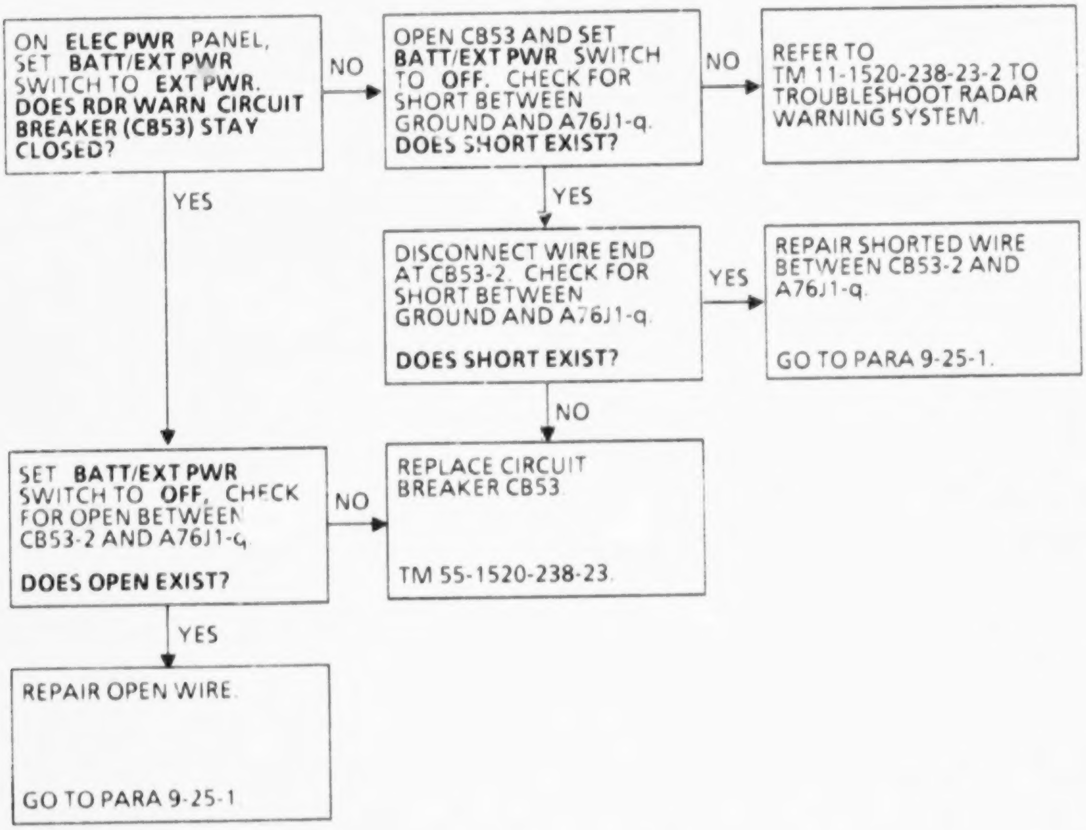
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions: (para 9-25-32)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES RDR WARN CIRCUIT BREAKER (CB53) STAY CLOSED?**

OPEN CB53 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76J1-q. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT RADAR WARNING SYSTEM.

DISCONNECT WIRE END AT CB53-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-q.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB53-2 AND A76J1-q.

GO TO PARA 9-25-1.

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN CB53-2 AND A76J1-q.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB53.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-34. PITOT HTR CIRCUIT BREAKER (CB36) - DOES NOT STAY CLOSED OR 28 VDC TO PILOT ANTI ICE PANEL IS NOT PRESENT AT A76J1-s

Tools: (para 9-25-32)

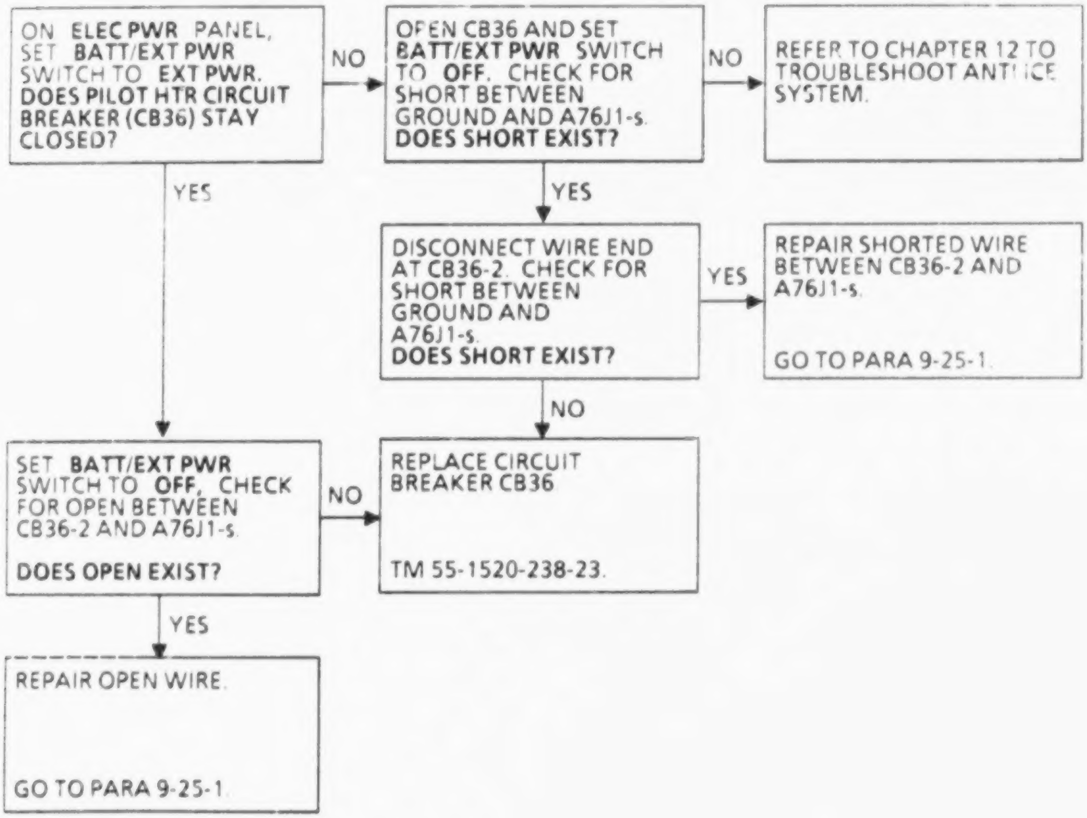
Personnel Required: (para 9-25-32)

References: (para 9-25-32)

Equipment Conditions: (para 9-25-32)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES PILOT HTR CIRCUIT BREAKER (CB36) STAY CLOSED?
NO
OPEN CB36 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-s. DOES SHORT EXIST?
NO
REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI ICE SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB36-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-s. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB36-2 AND A76J1-s.
GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR OPEN BETWEEN CB36-2 AND A76J1-s.
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB36
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

END OF TASK

9-25-35. COMM ICS CIRCUIT BREAKER (CB27) - DOES NOT STAY CLOSED OR 28 VDC TO AUDIO JUNCTION UNIT IS NOT PRESENT AT A76J1-a

Tools: (para 9-25-32)

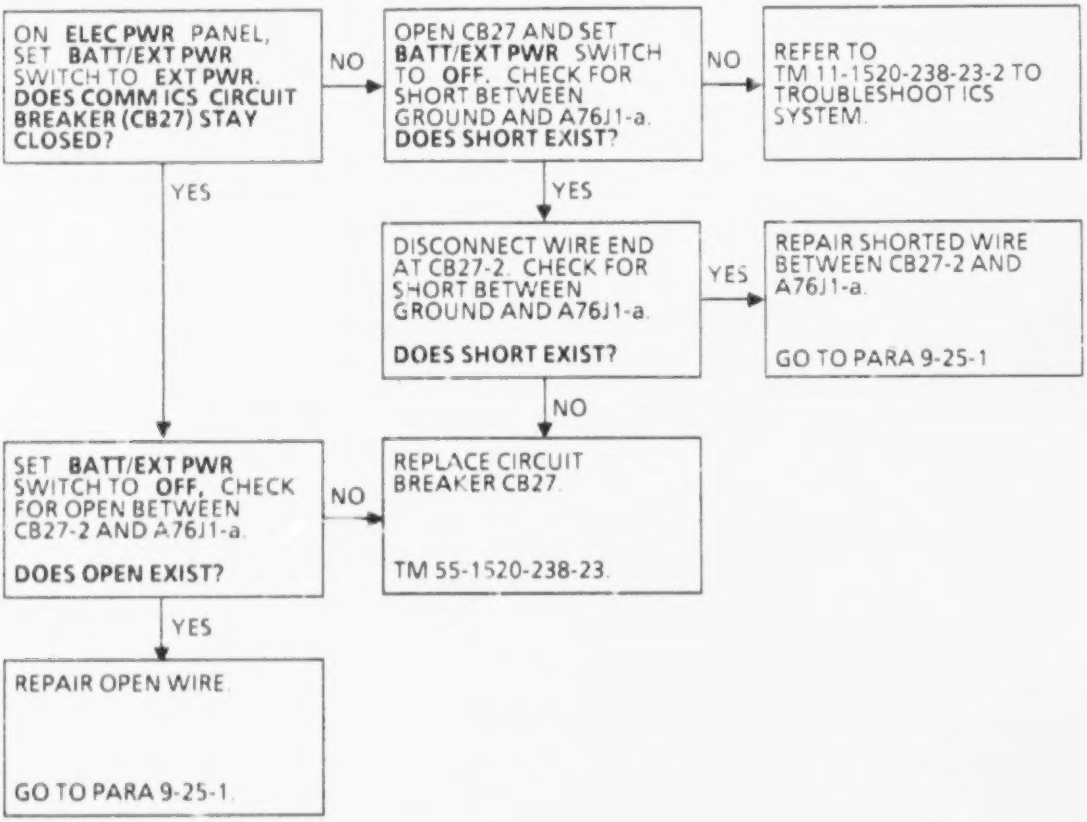
Personnel Required: (para 9-25-32)

References: (para 9-25-32)

Equipment Conditions: (para 9-25-32)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** **DOES COMM ICS CIRCUIT BREAKER (CB27) STAY CLOSED?**

OPEN CB27 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-a. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT ICS SYSTEM.

DISCONNECT WIRE END AT CB27-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-a.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB27-2 AND A76J1-a.

GO TO PARA 9-25-1

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN CB27-2 AND A76J1-a.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB27.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-36. COMM VHF FM CIRCUIT BREAKER (CB64) - DOES NOT STAY CLOSED OR 28 VDC TO PHASE FRONT HOMING MODULE IS NOT PRESENT AT A76J1-w

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

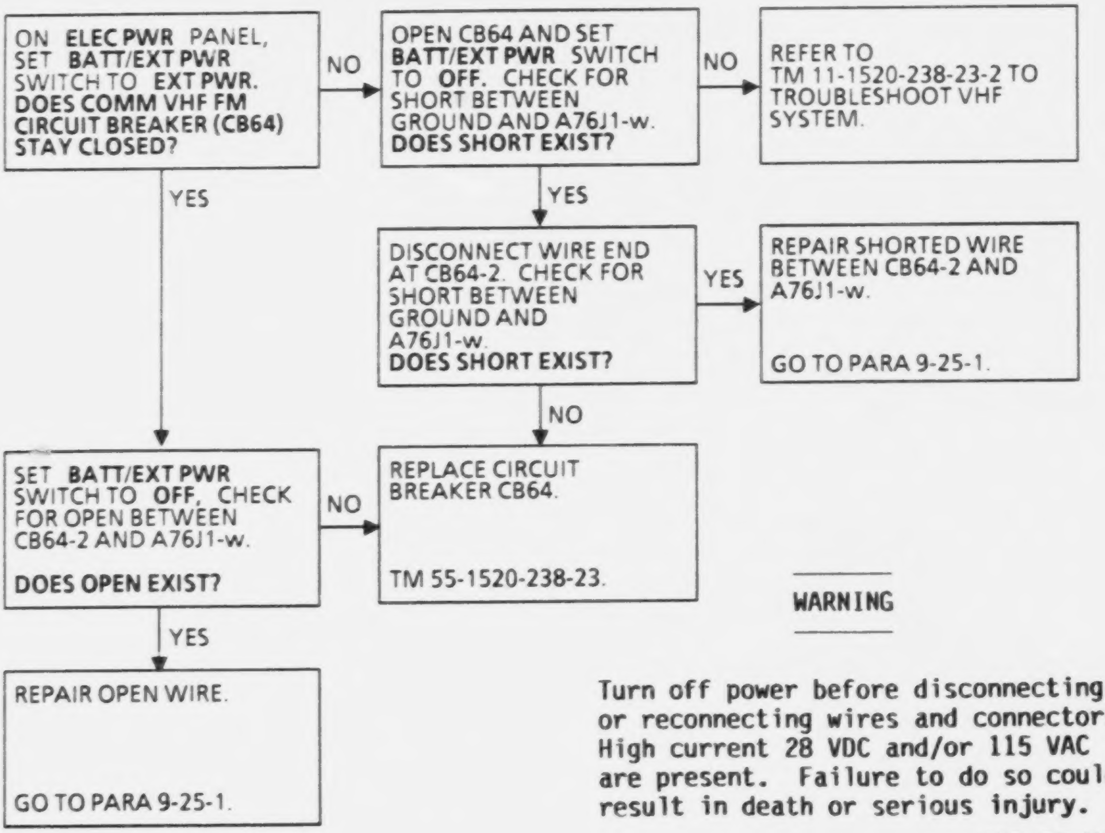
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM VHF FM CIRCUIT BREAKER (CB64) STAY CLOSED?
NO
OPEN CB64 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-w. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VHF SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB64-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-w. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB64-2 AND A76J1-w. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB64-2 AND A76J1-w. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB64. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-25-37. COMM KY-28 CIRCUIT BREAKER (CB30) - DOES NOT STAY CLOSED OR 28 VDC TO SECURE VOICE CONTROL PANEL IS NOT PRESENT AT A76J1-p

Tools: (para 9-25-36)

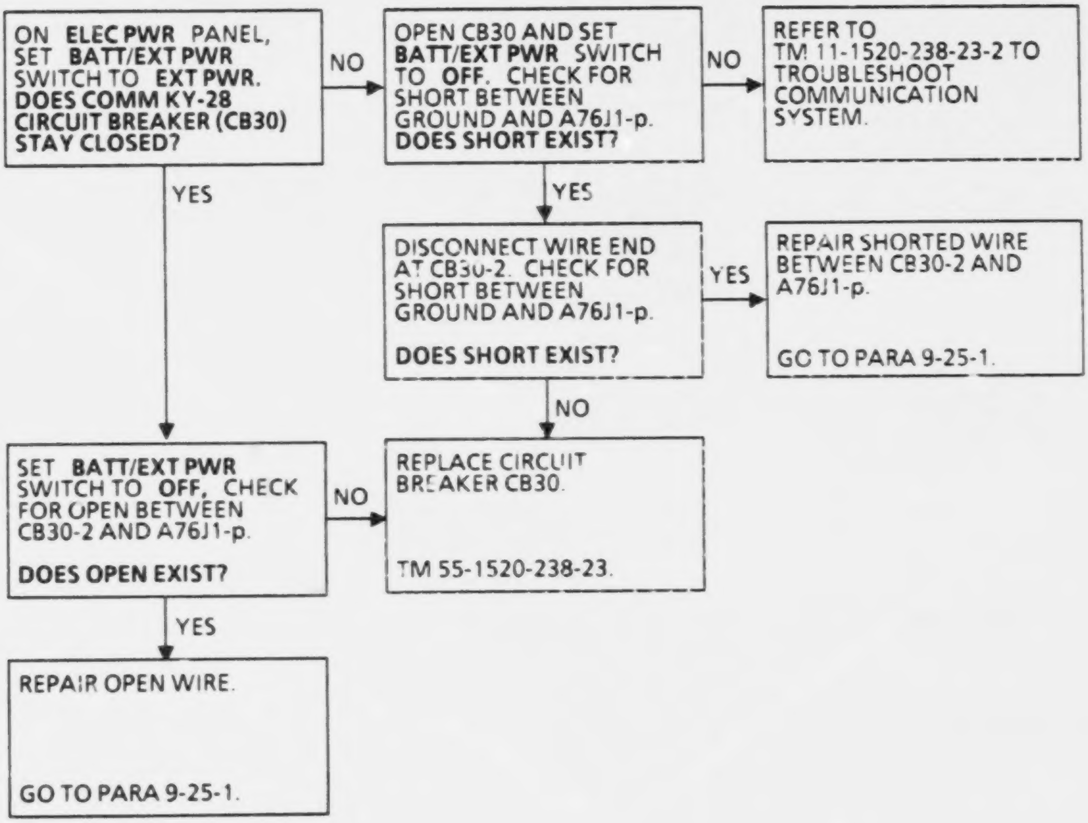
Personnel Required: (para 9-25-36)

References: (para 9-25-36)

Equipment Conditions: (para 9-25-36)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM KY-28 CIRCUIT BREAKER (CB30) STAY CLOSED?
NO
OPEN CB30 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-p. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT COMMUNICATION SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB30-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-p. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB30-2 AND A76J1-p. GO TO PARA 9-25-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB30-2 AND A76J1-p. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB30. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-38. COMM UHF AM CIRCUIT BREAKER (CB24) - DOES NOT STAY CLOSED OR 28 VDC TO UHF-AM RADIO CONTROL PANEL IS NOT PRESENT AT A76J1-v

Tools: (para 9-25-36)

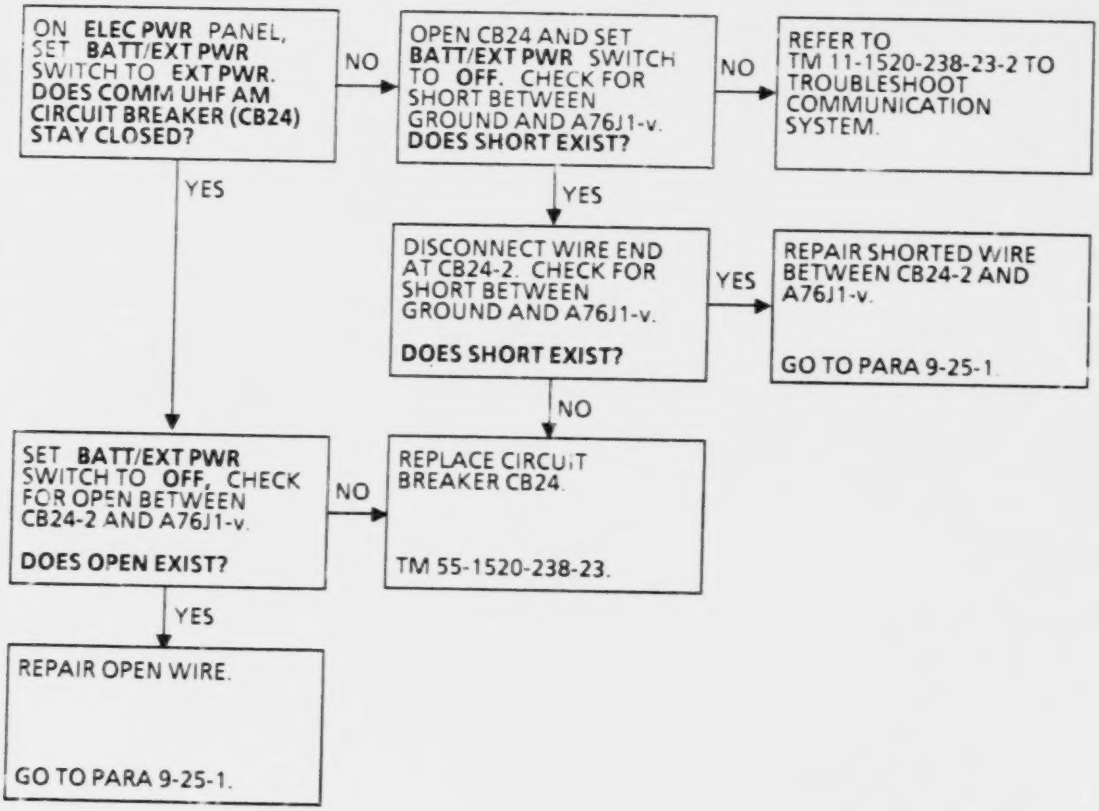
Personnel Required: (para 9-25-36)

References: (para 9-25-36)

Equipment Conditions: (para 9-25-36)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR.** **DOES COMM UHF AM CIRCUIT BREAKER (CB24) STAY CLOSED?**

OPEN CB24 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A76J1-v. **DOES SHORT EXIST?**

REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT COMMUNICATION SYSTEM.

DISCONNECT WIRE END AT CB24-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-v.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB24-2 AND A76J1-v.

GO TO PARA 9-25-1.

SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN CB24-2 AND A76J1-v.

DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB24.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

END OF TASK

9-25-39. COMM IFF CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED OR 28 VDC TO IFF RECEIVER TRANSMITTER IS NOT PRESENT AT A76J1-S

Tools: (para 9-25-36)

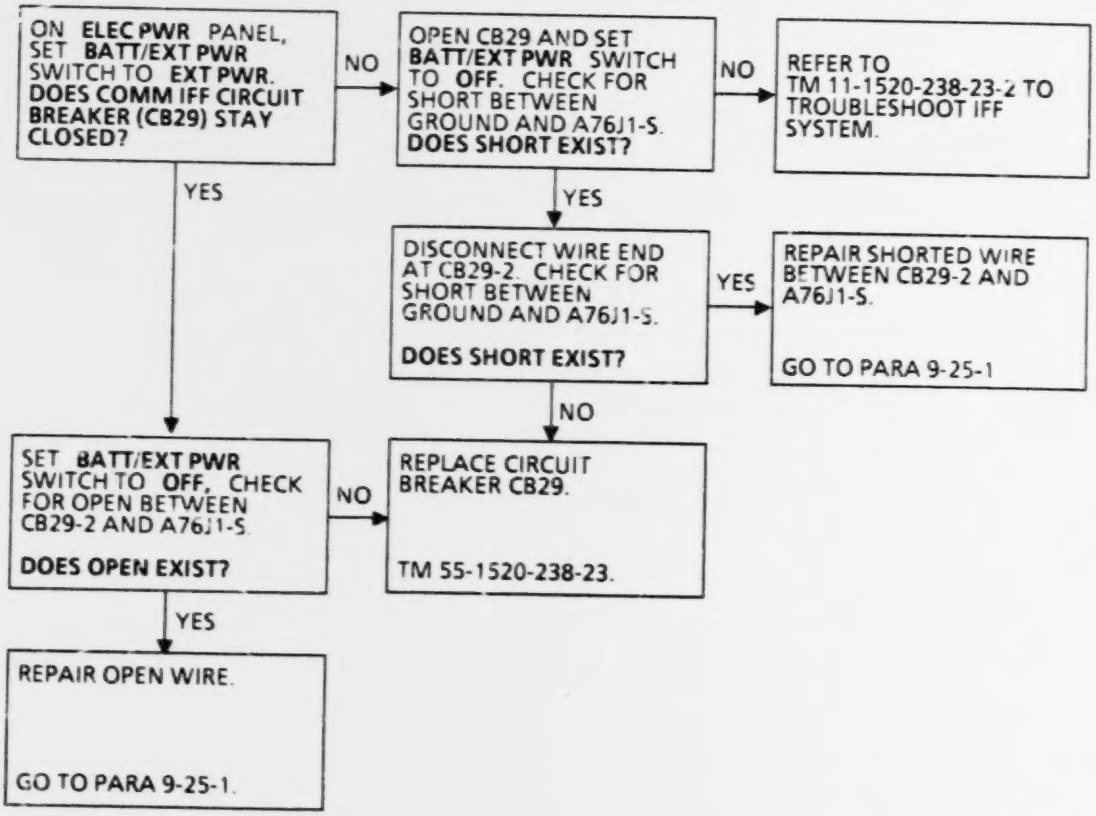
Personnel Required: (para 9-25-36)

References: (para 9-25-36)

Equipment Conditions: (para 9-25-36)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM IFF CIRCUIT BREAKER (CB29) STAY CLOSED?
NO
OPEN CB29 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-S. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT IFF SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB29-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-S. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB29-2 AND A76J1-S. GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB29-2 AND A76J1-S. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB29. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-40. COMM ADF CIRCUIT BREAKER (CB65) - DOES NOT STAY CLOSED OR 28 VDC TO DIRECTION FINDER RECEIVER IS NOT PRESENT AT A76J1-r

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

63F10	Aircraft Electrician One person to assist

References:

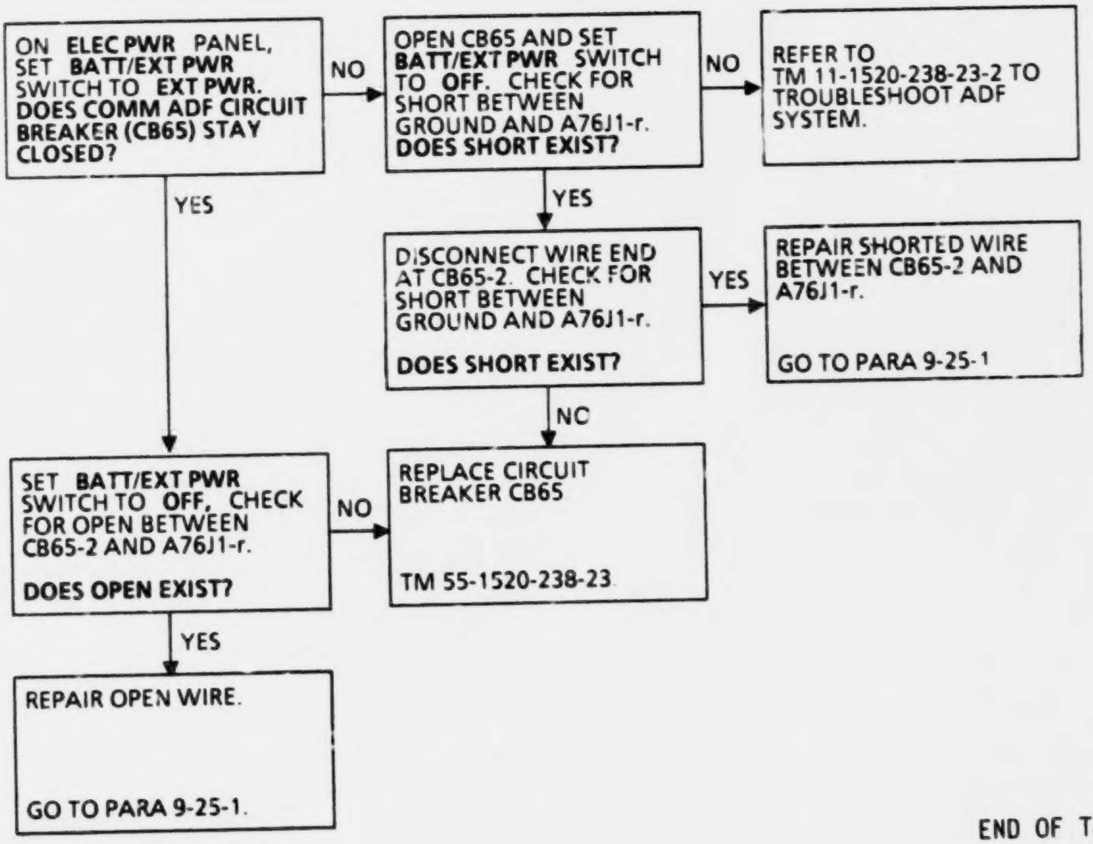
TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES COMM ADF CIRCUIT BREAKER (CB65) STAY CLOSED?
NO
OPEN CB65 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A76J1-r. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT ADF SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB65-2. CHECK FOR SHORT BETWEEN GROUND AND A76J1-r. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB65-2 AND A76J1-r. GO TO PARA 9-25-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB65-2 AND A76J1-r. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB65 TM 55-1520-238-23
YES
REPAIR OPEN WIRE. GO TO PARA 9-25-1.

END OF TASK

9-25-41. ECS CAB CIRCUIT BREAKER (CB76) - DOES NOT STAY CLOSED OR 28 VDC TO AUX PANEL IS NOT PRESENT AT A76P1-2

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

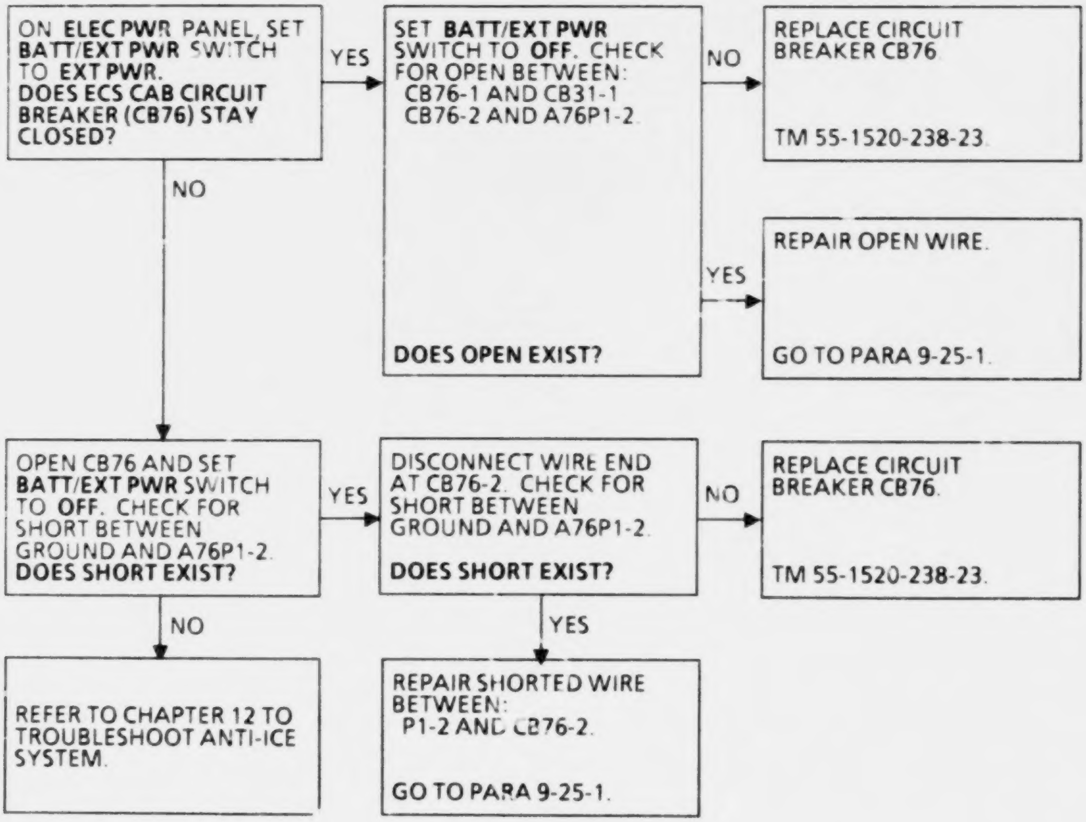
References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-15-2	Pilot circuit breaker panel accessing completed

REFER TO VOLTAGE WARNING



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR**. **DOES ECS CAB CIRCUIT BREAKER (CB76) STAY CLOSED?**

SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR OPEN BETWEEN:
CB76-1 AND CB31-1
CB76-2 AND A76P1-2.
DOES OPEN EXIST?

REPLACE CIRCUIT BREAKER CB76
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-25-1.

OPEN CB76 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A76P1-2. **DOES SHORT EXIST?**

DISCONNECT WIRE END AT CB76-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-2.
DOES SHORT EXIST?

REPLACE CIRCUIT BREAKER CB76.
TM 55-1520-238-23.

REFER TO CHAPTER 12 TO TROUBLESHOOT ANTI-ICE SYSTEM.

REPAIR SHORTED WIRE BETWEEN:
P1-2 AND CB76-2.
GO TO PARA 9-25-1.

END OF TASK

9-25-42. FUEL XFEED CIRCUIT BREAKER (CB55) - DOES NOT STAY CLOSED OR 28 VDC TO ENGINE 1 AND 2 FUEL VALVE ACTUATORS IS NOT PRESENT AT P1-32

Tools: (para 9-25-41)

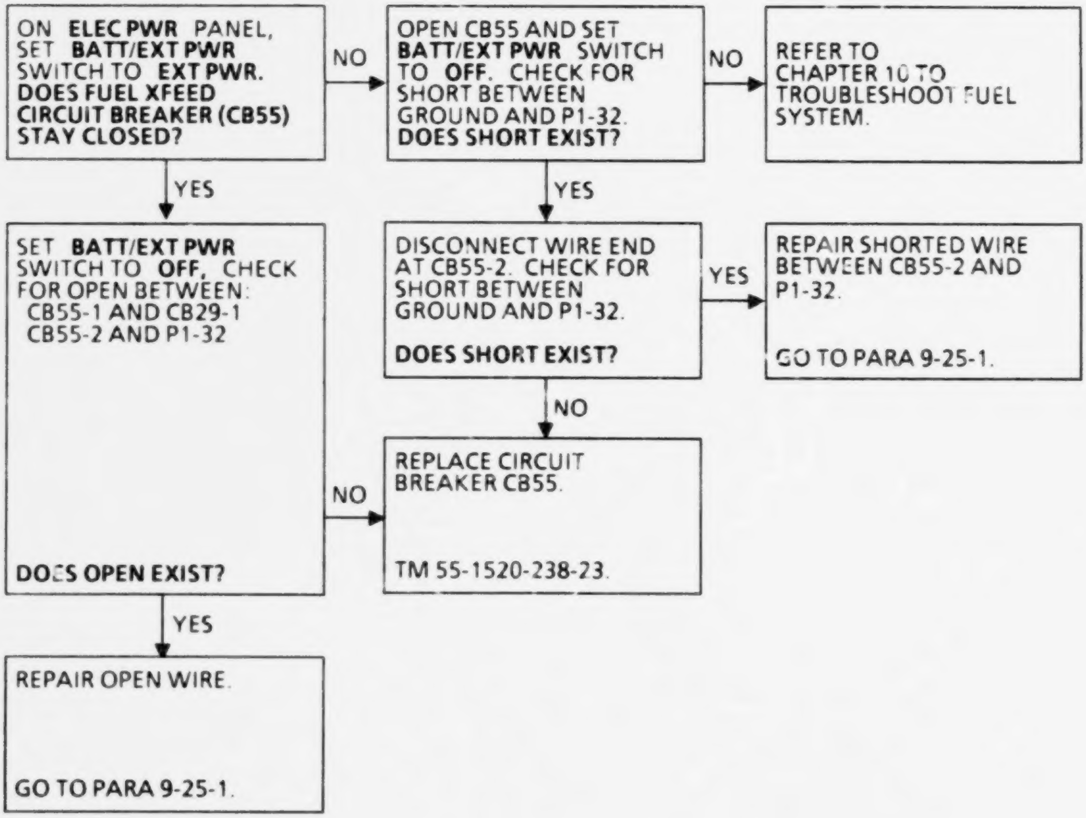
References: (para 9-25-41)

Personnel Required: (para 9-25-41)

Equipment Conditions: (para 9-25-41)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES FUEL XFEED CIRCUIT BREAKER (CB55) STAY CLOSED?**

OPEN CB55 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND P1-32. **DOES SHORT EXIST?**

REFER TO CHAPTER 10 TO TROUBLESHOOT FUEL SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB55-1 AND CB29-1
CB55-2 AND P1-32

DOES OPEN EXIST?

DISCONNECT WIRE END AT CB55-2. CHECK FOR SHORT BETWEEN GROUND AND P1-32.

DOES SHORT EXIST?

REPAIR SHORTED WIRE BETWEEN CB55-2 AND P1-32.

GO TO PARA 9-25-1.

REPLACE CIRCUIT BREAKER CB55.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-25-1.

9-26-1. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

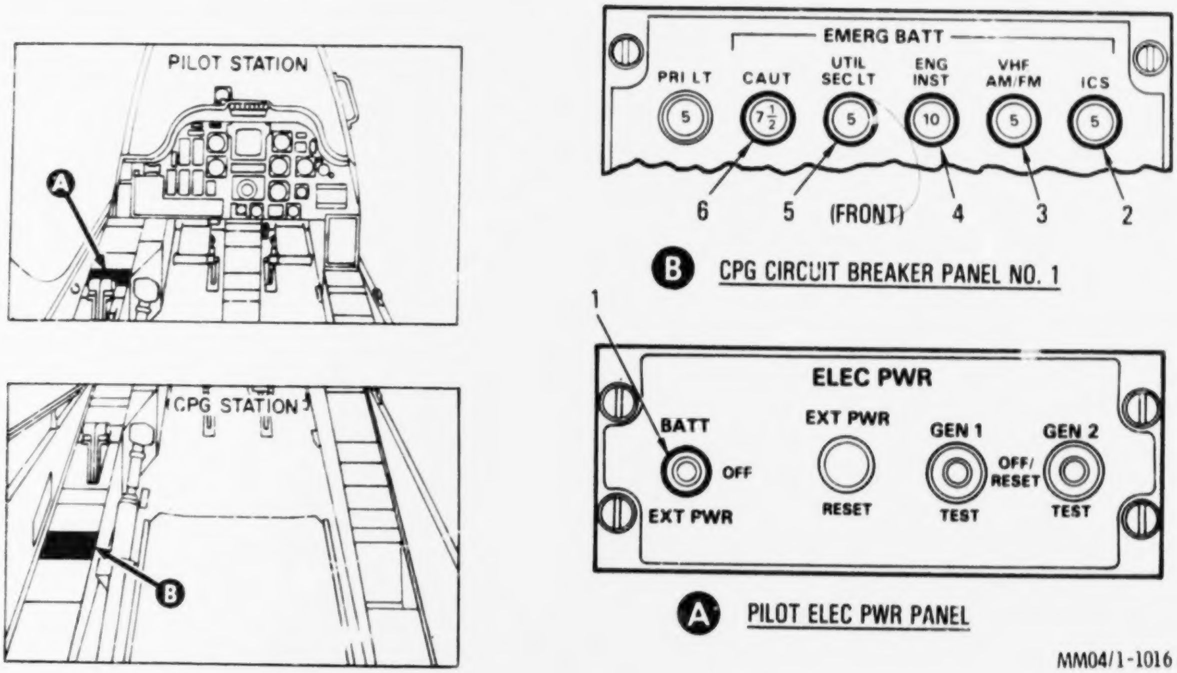
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

A. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR.**



MM04/1-1016

9-26-1

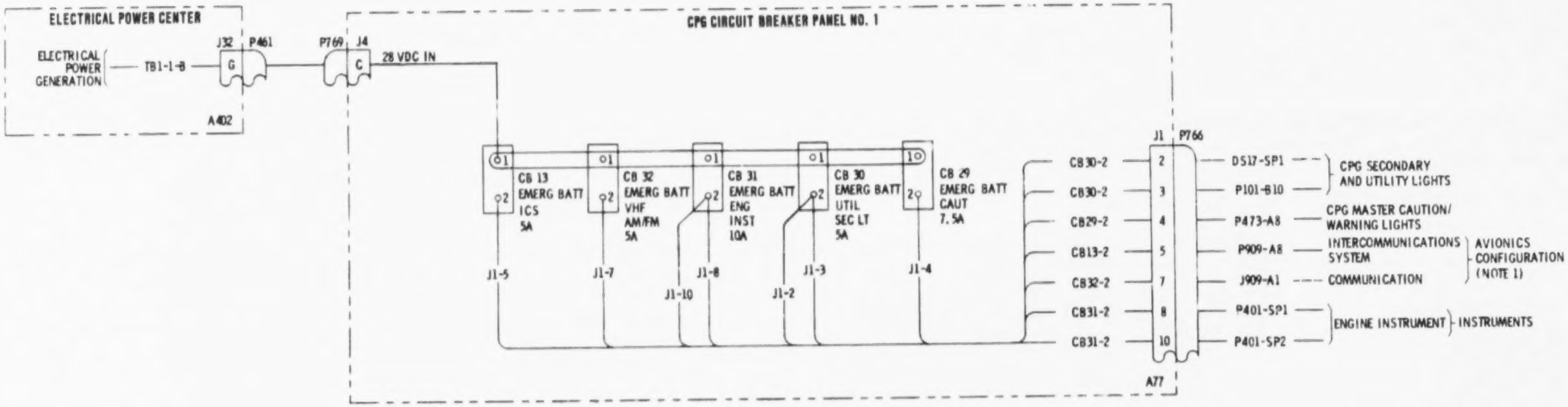
B. Complete operational check as follows:

TASK	RESULT
1. Close all CPG DC emergency circuit breakers.	If **EMERG BATT ICS** CB13 (2) does not stay closed, go to para 9-26-4. If **EMERG BATT VHF AM/FM** circuit breaker CB32 (3) does not stay closed, go to para 9-26-6. If **EMERG BATT ENG INST** circuit breaker CB31 (4) does not stay closed, go to para 9-26-7. If **EMERG BATT UTIL SEC LT** circuit breaker CB30 (5) does not stay closed, go to para 9-26-8. If **EMERG BATT CAUT** circuit breaker CB29 (6) does not stay closed, go to para 9-26-9.
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to OFF and remove CPG circuit breaker panel no. 1 (TM 55-1520-238-23). Disconnect P766 and P769.	
3. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **EXT PWR**. Check for 28 VDC at P769-C.	If 28 VDC is not present at P769-C, go to para 9-26-5.
4. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to OFF and check for continuity between J4-C and CB29-1.	If continuity does not exist, go to para 9-26-5.
5. Check for continuity to audio junction unit between J4-C and J1-5.	If continuity does not exist, go to para 9-26-4.
6. Check for continuity to radio control panel between J4-C and J1-7.	If continuity does not exist, go to para 9-26-6.
7. Check for continuity to signal data converter between J4-C and J1-8, -10.	If continuity does not exist, go to para 9-26-7.
8. Check for continuity to CPG interior light panel between J4-C and J1-2,-3.	If continuity does not exist, go to para 9-26-9.
9. Check for continuity to master and caution/warning panels between J4-C and J1-4.	If continuity does not exist, go to para 9-26-9.

C. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).
D. Reconnect P766 and P769.
E. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-26-2. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - CPG STATION) - INTERCONNECTION DIAGRAM

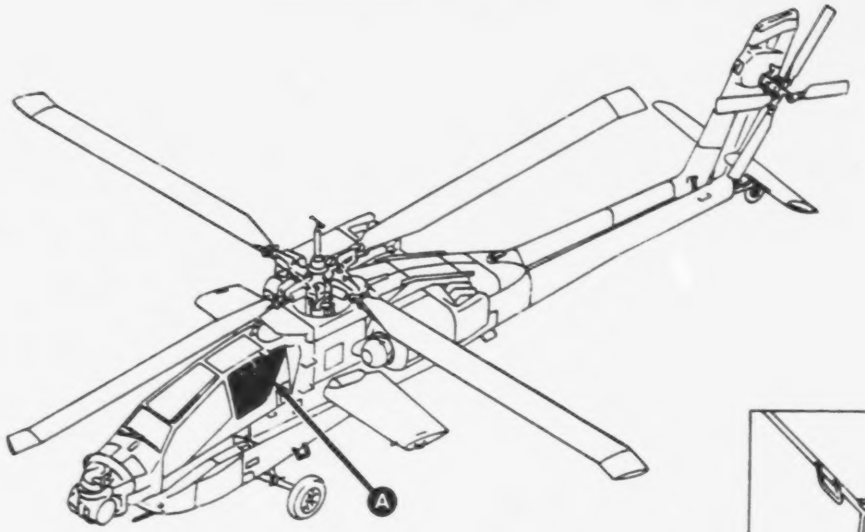

ELECTRICAL POWER CENTER
ELECTRICAL POWER GENERATION
TB1-1-B
J32
P461
G
A402
P769
J4
C
28 VDC IN
CPG CIRCUIT BREAKER PANEL NO. 1
CB 13 EMERG BATT ICS 5A
CB 32 EMERG BATT VHF AM/FM 5A
CB 31 EMERG BATT ENG INST 10A
CB 30 EMERG BATT UTIL SEC LT 5A
CB 29 EMERG BATT CAUT 7.5A
J1-5
J1-7
J1-10
J1-8
J1-2
J1-3
J1-4
J1
P766
CB30-2
CB30-2
CB29-2
CB13-2
CB32-2
CB31-2
CB31-2
2
3
4
5
7
8
10
DS17-SP1
P101-B10
P473-A8
P909-A8
J909-A1
P401-SP1
P401-SP2
CPG SECONDARY AND UTILITY LIGHTS
CPG MASTER CAUTION/ WARNING LIGHTS
INTERCOMMUNICATIONS SYSTEM
COMMUNICATION
AVIONICS CONFIGURATION (NOTE 1)
ENGINE INSTRUMENT
INSTRUMENTS
A77

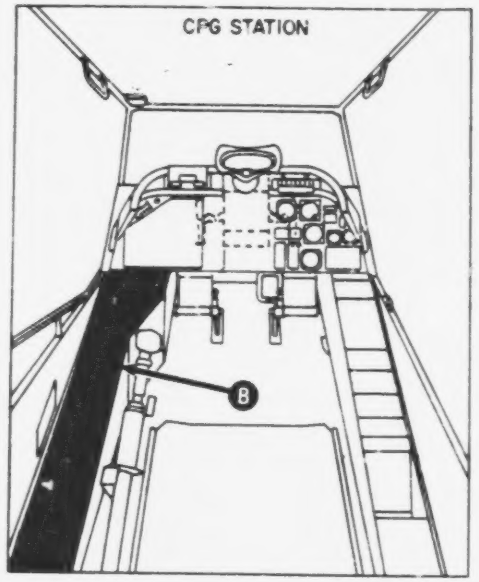
NOTE:

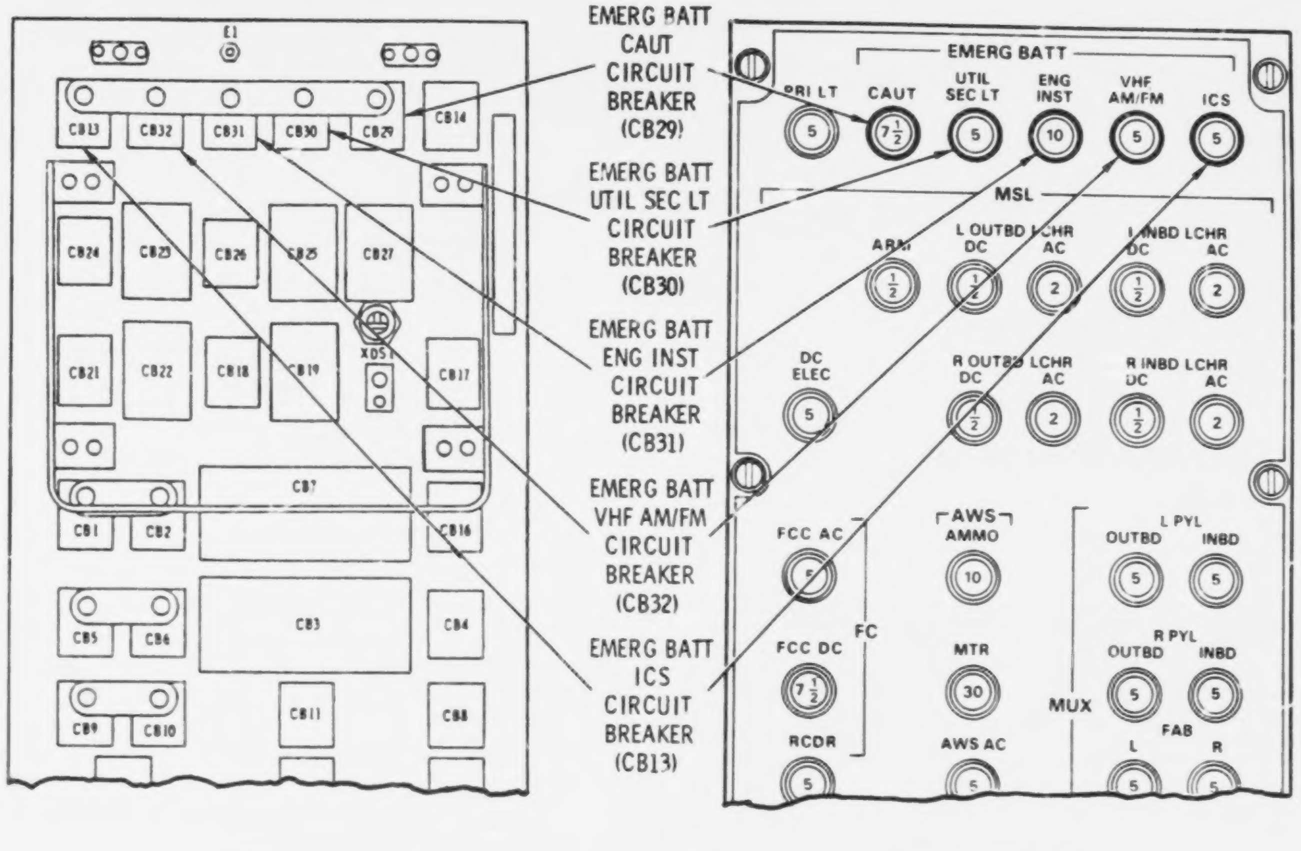
1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

MM04/1-769A

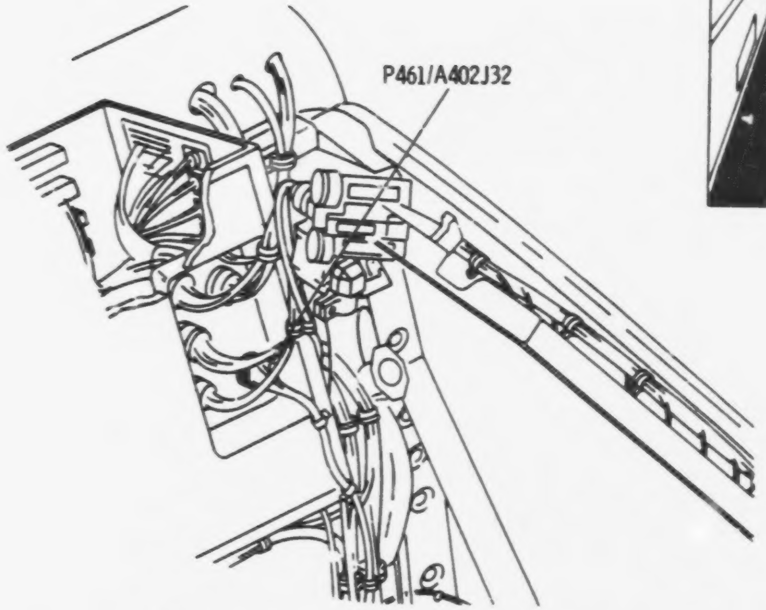
9-26-3. CIRCUIT PROTECTION SYSTEM (DC EMERGENCY BUS - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



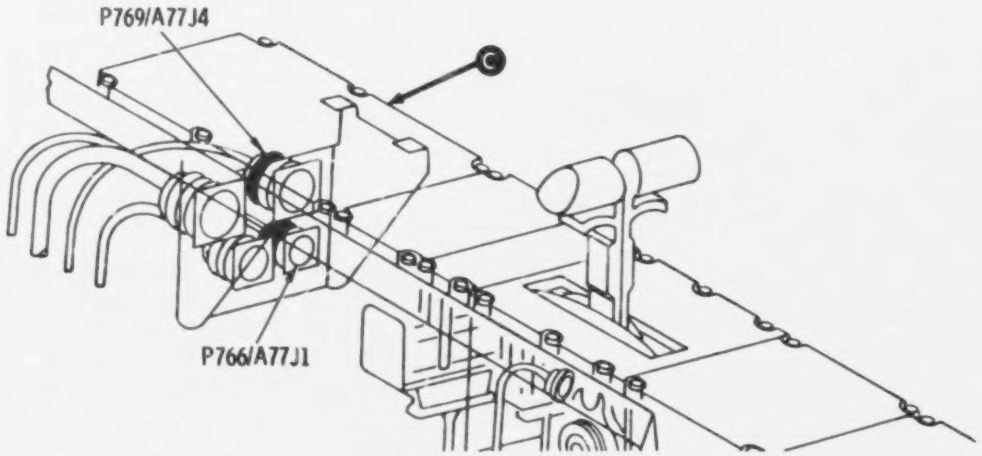




C CPG CIRCUIT BREAKER PANEL NO. 1



A PILOT STATION (LEFT CONSOLE)



B CPG STATION LEFT CONSOLE

MM04/1-1193B

9-26-4. EMERG BATT ICS CIRCUIT BREAKER (CB13) - DOES NOT STAY CLOSED OR CONTINUITY TO AUDIO JUNCTION UNIT DOES NOT EXIST BETWEEN J4-C AND J1-5

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

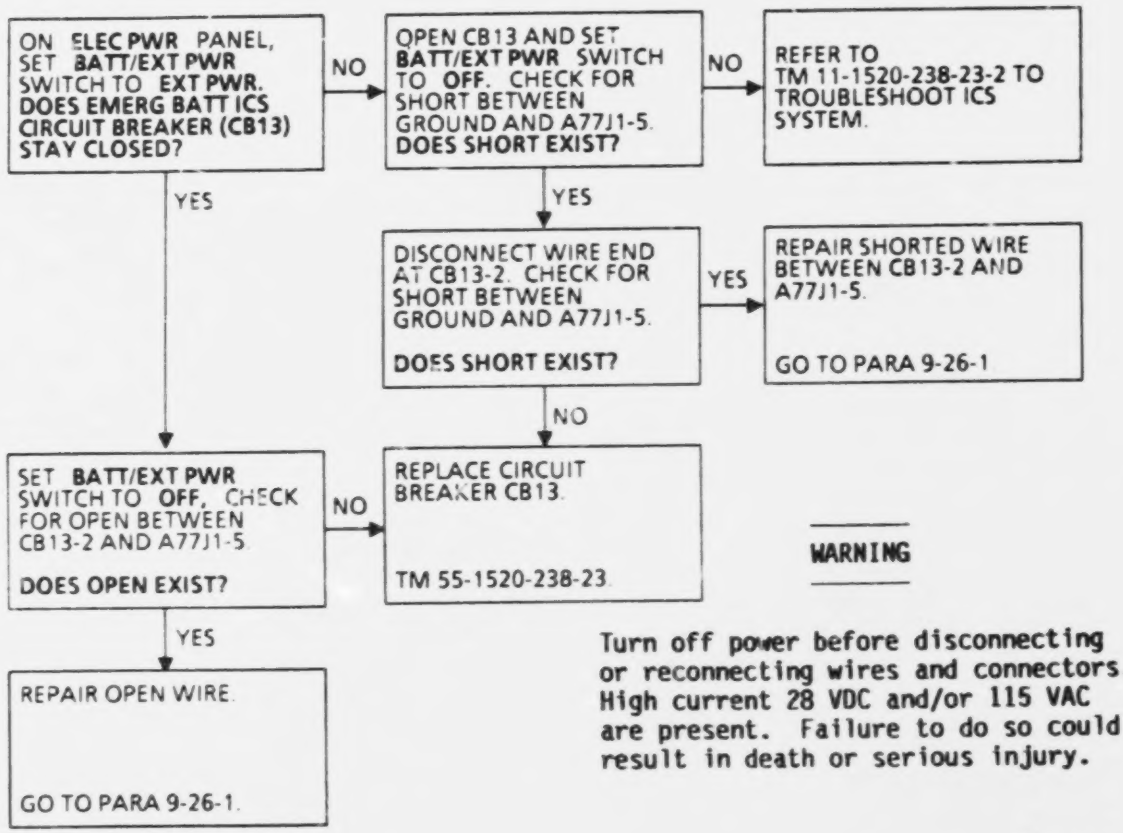
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panel no. 1 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT ICS CIRCUIT BREAKER (CB13) STAY CLOSED?
NO
OPEN CB13 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-5. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT ICS SYSTEM.
YES
DISCONNECT WIRE END AT CB13-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-5. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB13-2 AND A77J1-5. GO TO PARA 9-26-1.
NO
REPLACE CIRCUIT BREAKER CB13. TM 55-1520-238-23.
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB13-2 AND A77J1-5. DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE. GO TO PARA 9-26-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-26-5. CONTINUITY - DOES NOT EXIST BETWEEN A77J4-C AND CB29-1 OR 28 VDC IS NOT PRESENT AT P769-C

Tools: (para 9-26-4)

Personnel Required: (para 9-26-4)

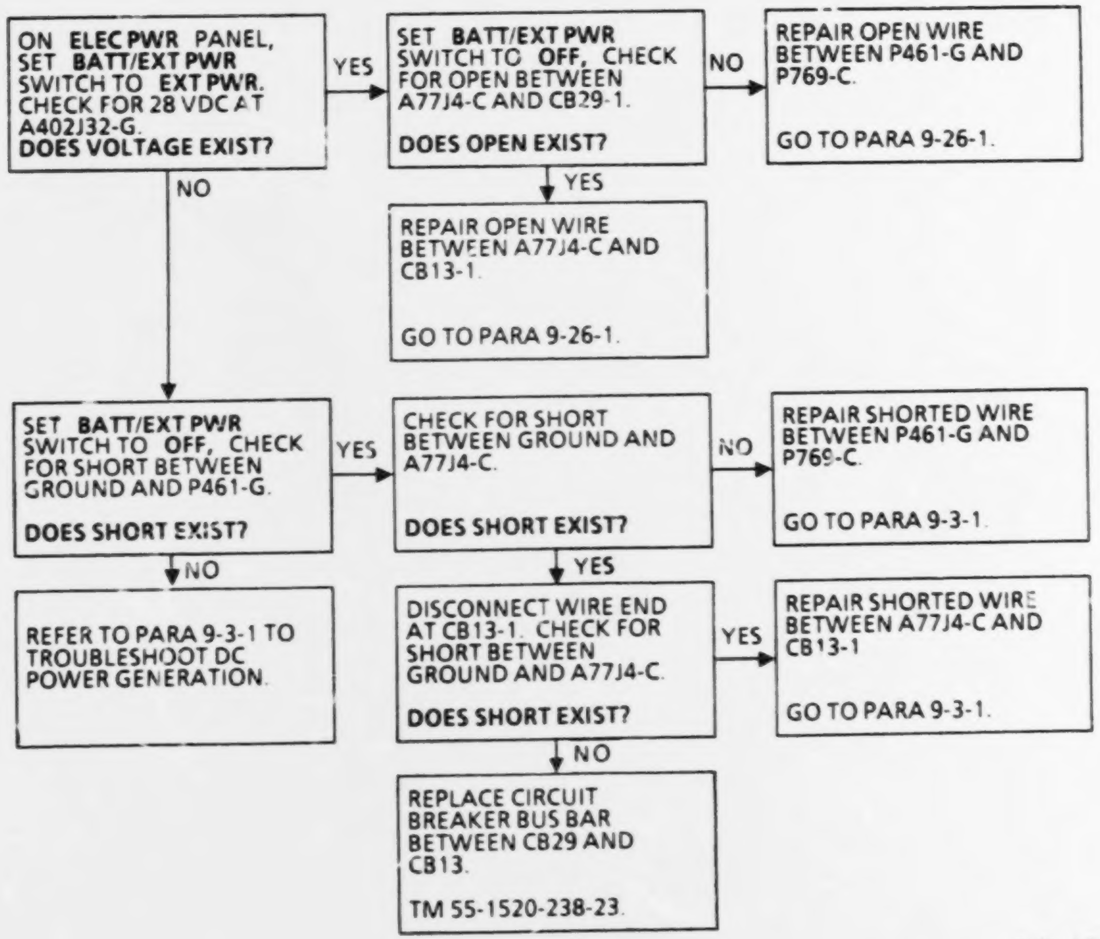
References:

TM 55-1520-238-23

REFER TO VOLTAGE WARNING

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-26-1	All DC emergency circuit breakers open


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. CHECK FOR 28 VDC AT A402J32-G. DOES VOLTAGE EXIST?
YES
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN A77J4-C AND CB29-1. DOES OPEN EXIST?
NO
REPAIR OPEN WIRE BETWEEN P461-G AND P769-C. GO TO PARA 9-26-1.
YES
REPAIR OPEN WIRE BETWEEN A77J4-C AND CB13-1. GO TO PARA 9-26-1.
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR SHORT BETWEEN GROUND AND P461-G. DOES SHORT EXIST?
YES
CHECK FOR SHORT BETWEEN GROUND AND A77J4-C. DOES SHORT EXIST?
NO
REPAIR SHORTED WIRE BETWEEN P461-G AND P769-C. GO TO PARA 9-3-1.
NO
REFER TO PARA 9-3-1 TO TROUBLESHOOT DC POWER GENERATION.
YES
DISCONNECT WIRE END AT CB13-1. CHECK FOR SHORT BETWEEN GROUND AND A77J4-C. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A77J4-C AND CB13-1. GO TO PARA 9-3-1.
NO
REPLACE CIRCUIT BREAKER BUS BAR BETWEEN CB29 AND CB13. TM 55-1520-238-23.

END OF TASK

9-26-6. EMERG BATT VHF AM/FM CIRCUIT BREAKER (CB32) - DOES NOT STAY CLOSED OR CONTINUITY TO RADIO CONTROL PANEL DOES NOT EXIST BETWEEN J4-C AND J1-7

Tools: (para 9-26-4)

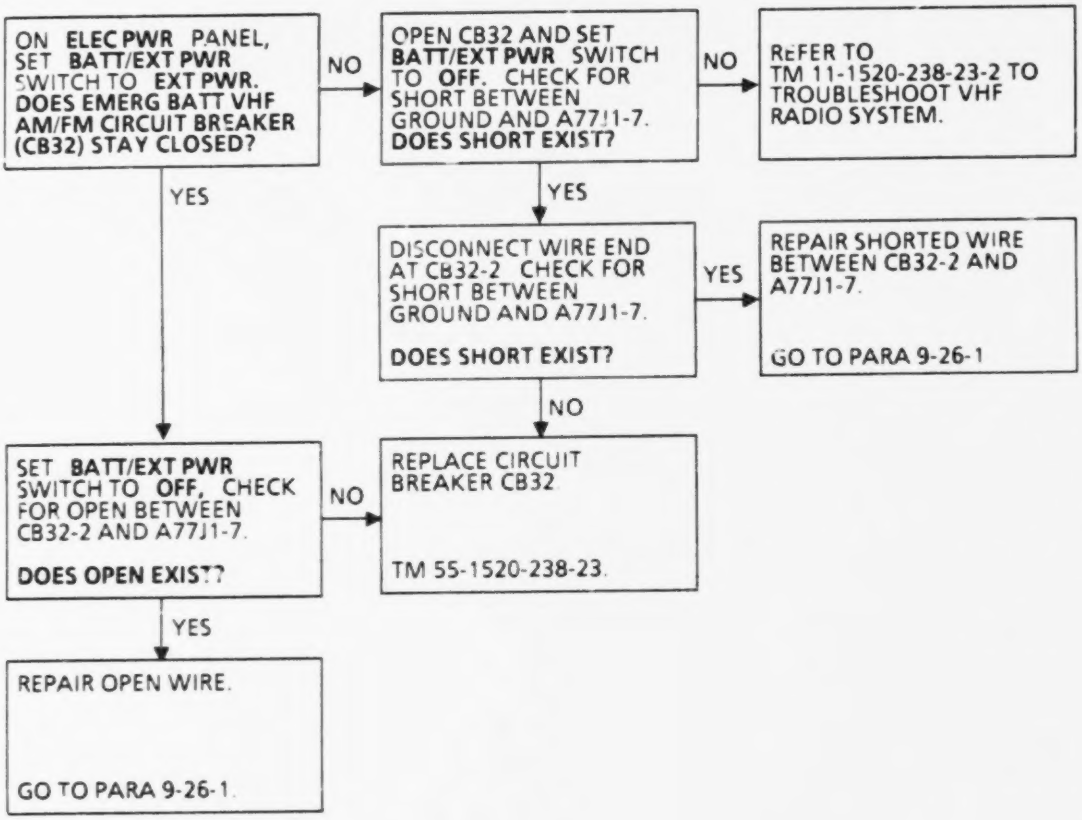
Personnel Required: (para 9-26-4)

References: (para 9-26-4)

Equipment Conditions: (para 9-26-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON ELEC PWR PANEL, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES EMERG BATT VHF AM/FM CIRCUIT BREAKER (CB32) STAY CLOSED?
NO
OPEN CB32 AND SET BATT/EXT PWR SWITCH TO OFF. CHECK FOR SHORT BETWEEN GROUND AND A77J1-7. DOES SHORT EXIST?
NO
REFER TO TM 11-1520-238-23-2 TO TROUBLESHOOT VHF RADIO SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB32-2 CHECK FOR SHORT BETWEEN GROUND AND A77J1-7. DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN CB32-2 AND A77J1-7. GO TO PARA 9-26-1
NO
SET BATT/EXT PWR SWITCH TO OFF, CHECK FOR OPEN BETWEEN CB32-2 AND A77J1-7. DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB32 TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-26-1.

END OF TASK

9-26-7. EMERG BATT ENG INST CIRCUIT BREAKER (CB31) - DOES NOT STAY CLOSED OR CONTINUITY TO SIGNAL DATA CONVERTER DOES NOT EXIST BETWEEN J4-C AND J1-8, -10

9-26-6/9-26-7

Tools: (para 9-26-4)

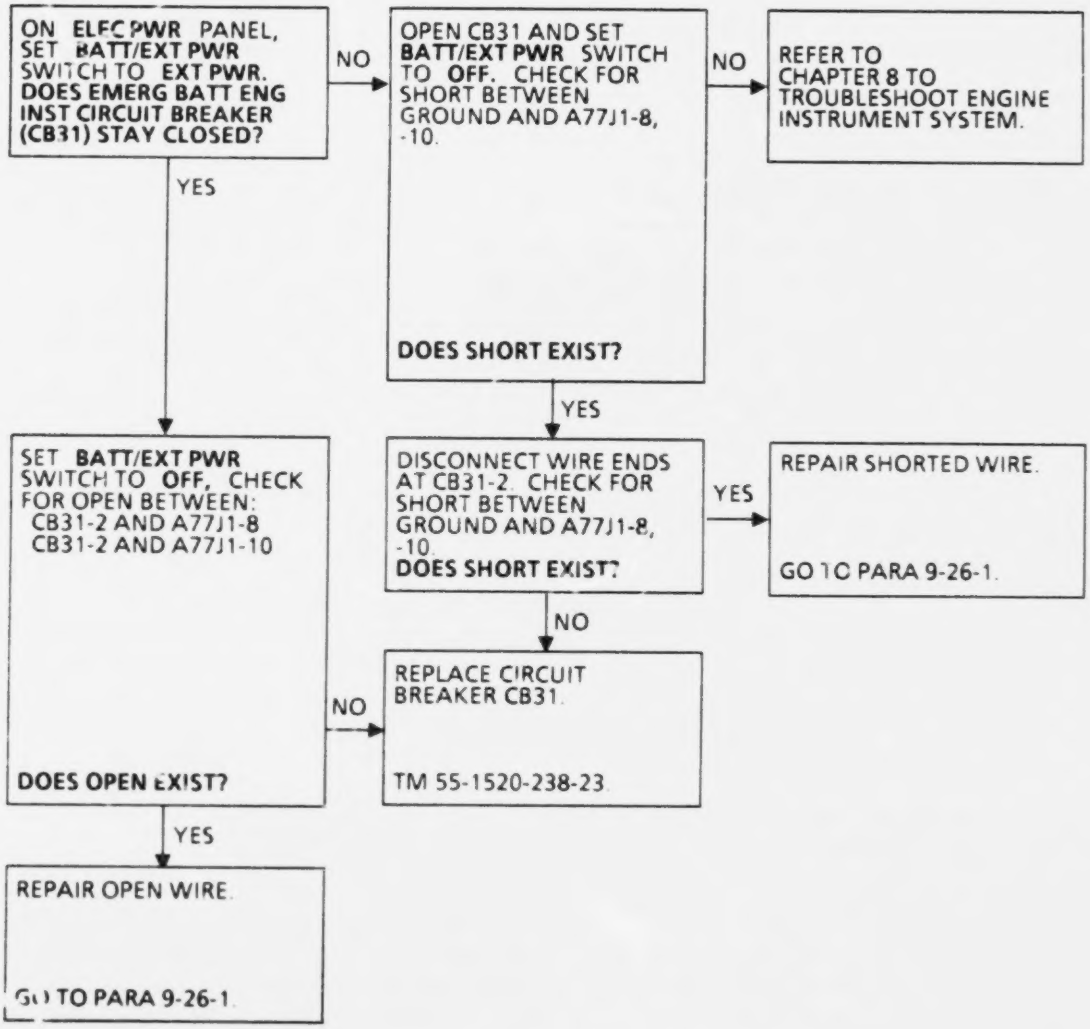
Personnel Required: (para 9-26-4)

References: (para 9-26-4)

Equipment Conditions: (para 9-26-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES EMERG BATT ENG INST CIRCUIT BREAKER (CB31) STAY CLOSED?**

OPEN CB31 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A77J1-8, -10. **DOES SHORT EXIST?**

REFER TO CHAPTER 8 TO TROUBLESHOOT ENGINE INSTRUMENT SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB31-2 AND A77J1-8
CB31-2 AND A77J1-10
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB31-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-8, -10. **DOES SHORT EXIST?**

REPAIR SHORTED WIRE.

GO TO PARA 9-26-1.

REPLACE CIRCUIT BREAKER CB31.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-26-1.

END OF TASK

9-26-8. EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30) - DOES NOT STAY CLOSED OR CONTINUITY TO CPG INTERIOR LIGHT PANEL DOES NOT EXIST BETWEEN J4-C AND J1-2, -3

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

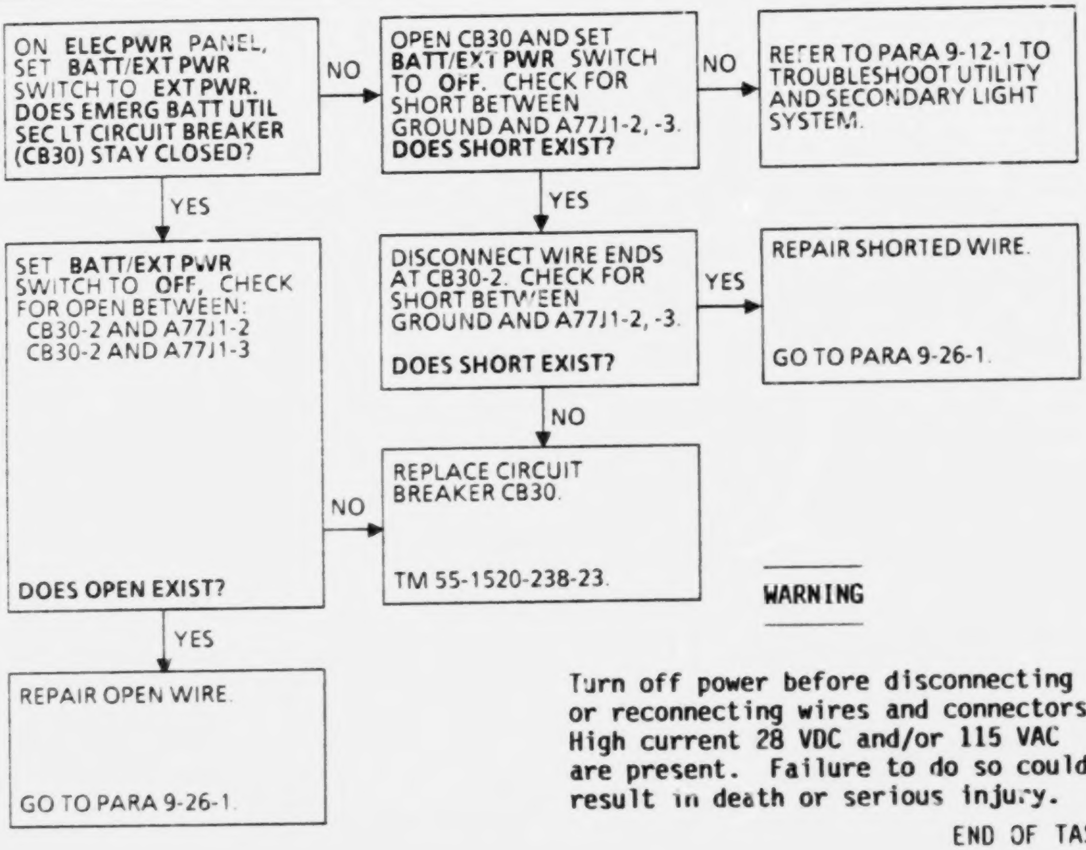
REFER TO VOLTAGE WARNING

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - CPG circuit breaker panel No. 1 lowered
Para 9-5-2	EXTERNAL POWER - POWER UP completed


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES EMERG BATT UTIL SEC LT CIRCUIT BREAKER (CB30) STAY CLOSED?**

OPEN CB30 AND SET **BATT/EXT PWR** SWITCH TO **OFF**. CHECK FOR SHORT BETWEEN GROUND AND A77J1-2, -3. **DOES SHORT EXIST?**

REFER TO PARA 9-12-1 TO TROUBLESHOOT UTILITY AND SECONDARY LIGHT SYSTEM.

SET **BATT/EXT PWR** SWITCH TO **OFF**, CHECK FOR OPEN BETWEEN:
CB30-2 AND A77J1-2
CB30-2 AND A77J1-3
DOES OPEN EXIST?

DISCONNECT WIRE ENDS AT CB30-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-2, -3.
DOES SHORT EXIST?

REPAIR SHORTED WIRE.
GO TO PARA 9-26-1.

REPLACE CIRCUIT BREAKER CB30.
TM 55-1520-238-23.

REPAIR OPEN WIRE.
GO TO PARA 9-26-1.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-26-9. EMERG BATT CAUT CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED OR CONTINUITY TO MASTER AND CAUTION/WARNING PANELS DOES NOT EXIST BETWEEN J4-C AND J1-4

Tools: (para 9-26-8)

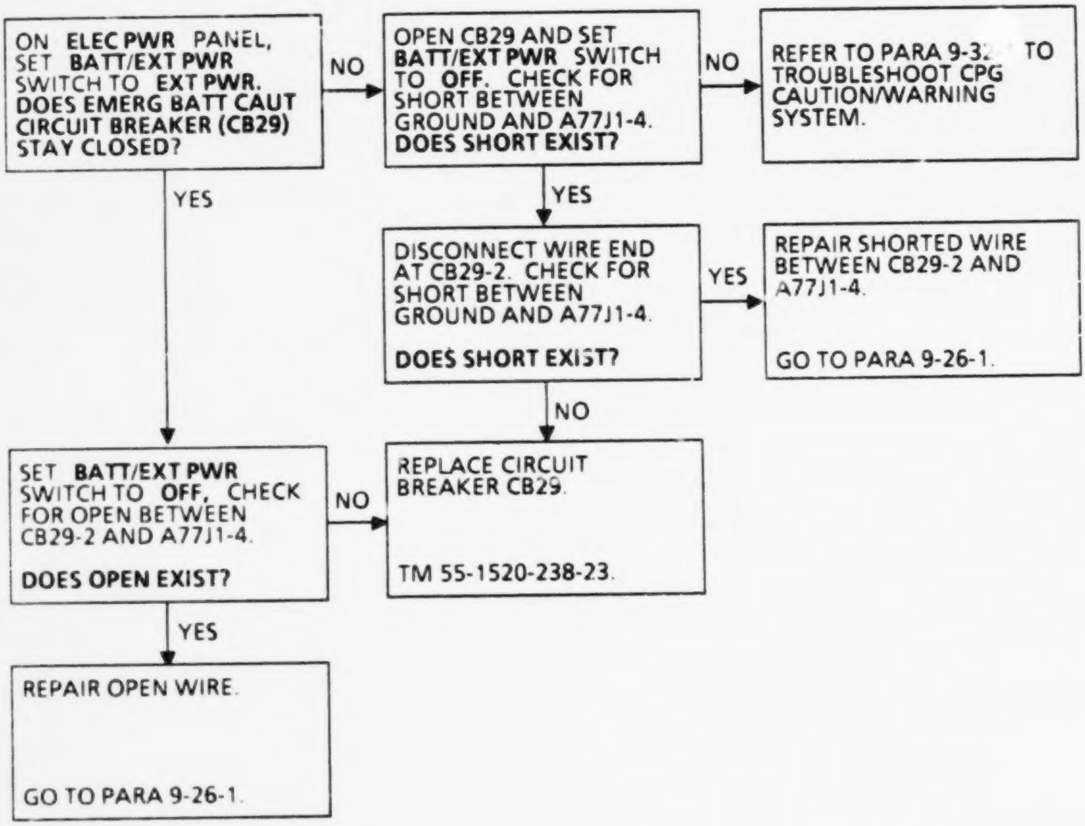
Personnel Required: (para 9-26-8)

References: (para 9-26-8)

Equipment Conditions: (para 9-26-8)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON **ELEC PWR** PANEL, SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES EMERG BATT CAUT CIRCUIT BREAKER (CB29) STAY CLOSED?**
NO
OPEN CB29 AND SET **BATT/EXT PWR** SWITCH TO **OFF.** CHECK FOR SHORT BETWEEN GROUND AND A77J1-4. **DOES SHORT EXIST?**
NO
REFER TO PARA 9-32[illegible] TO TROUBLESHOOT CPG CAUTION/WARNING SYSTEM.
YES
YES
DISCONNECT WIRE END AT CB29-2. CHECK FOR SHORT BETWEEN GROUND AND A77J1-4. **DOES SHORT EXIST?**
YES
REPAIR SHORTED WIRE BETWEEN CB29-2 AND A77J1-4. GO TO PARA 9-26-1.
NO
SET **BATT/EXT PWR** SWITCH TO **OFF,** CHECK FOR OPEN BETWEEN CB29-2 AND A77J1-4. **DOES OPEN EXIST?**
NO
REPLACE CIRCUIT BREAKER CB29. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-26-1.

END OF TASK

9-27-1. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - PILOT STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

TM 55-1520-238-23
TM 11-1520-238-23-2

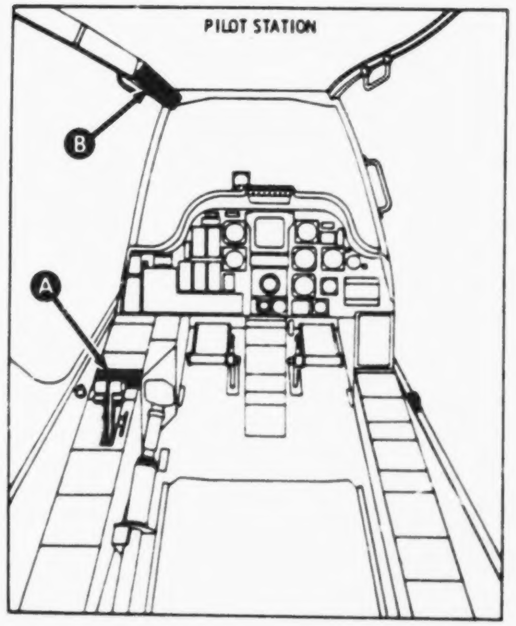
Equipment Conditions:

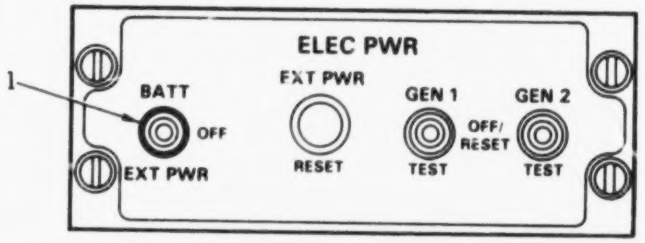
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

> Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

A. Check that **MISSION RDR JAM DC** CB72 (3) and **IR JAM PWR** CB63 (2) circuit breakers are closed.





A PILOT ELEC PWR PANEL

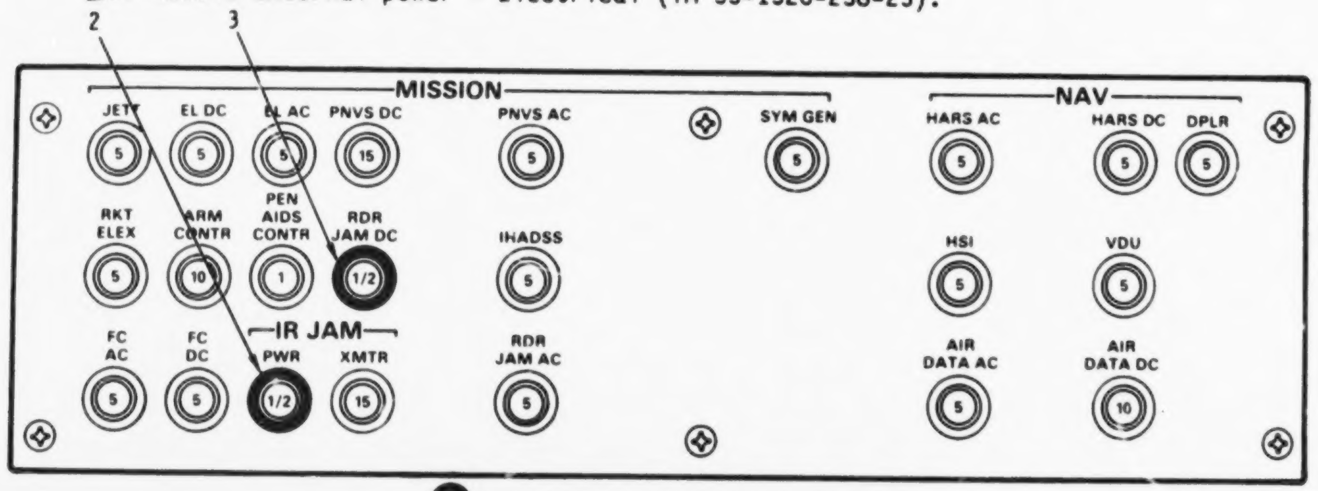
MM04/1-1017B

B. Complete operational check as follows:

TASK	RESULT
1. Check that CB72 (3) and CB63 (2) remain closed.	If CB63 or CB72 do not stay closed, refer to TM 11-1520-238-23-2 to troubleshoot radar and IR jammer system.
2. On **ELEC PWR** panel, set **BATT/EXT PWR** switch (1) to **OFF**.	
3. Disconnect A76P1.	
4. Check for short between ground and A76P1-50.	If short exists, go to para 9-27-4.
5. Check for short between ground and A76P1-1.	If short exists, go to para 9-27-5.
6. Check for open between A76P1-50 and -16.	If open exists, go to para 9-27-4.
7. Check for open between A76P1-1 and -8.	If open exists, go to para 9-27-5.
8. Check for open between A402J1-8 and -16.	If open exists, go to para 9-27-6.

C. Reconnect A76P1.

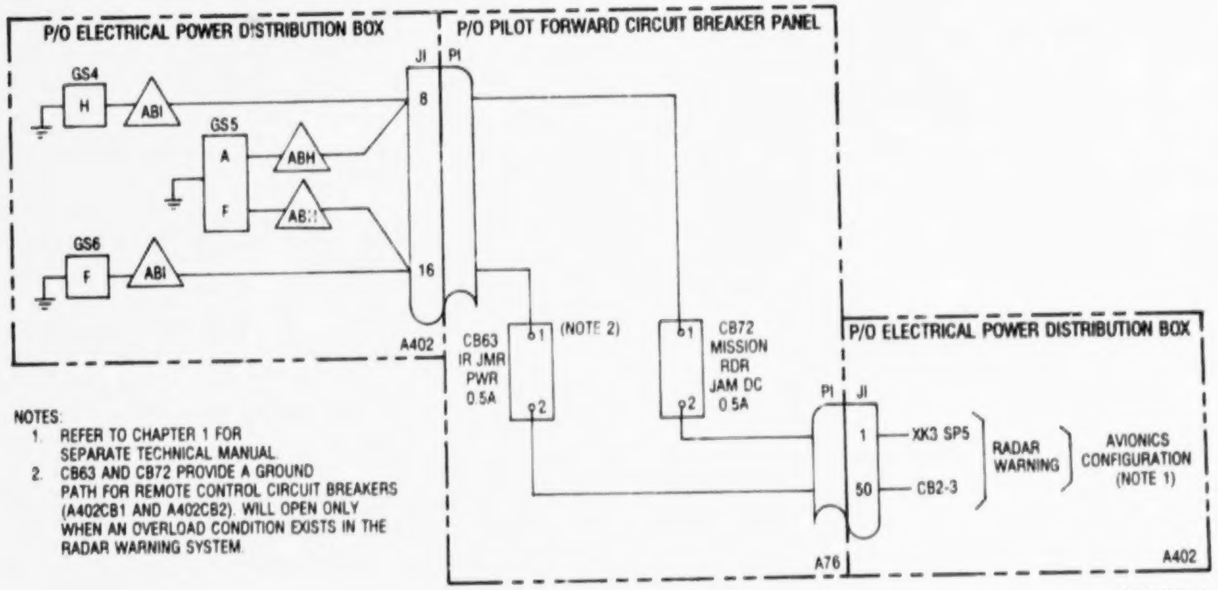
D. Remove external power - Electrical (TM 55-1520-238-23).



B PILOT FORWARD CIRCUIT BREAKER PANEL

END OF TASK

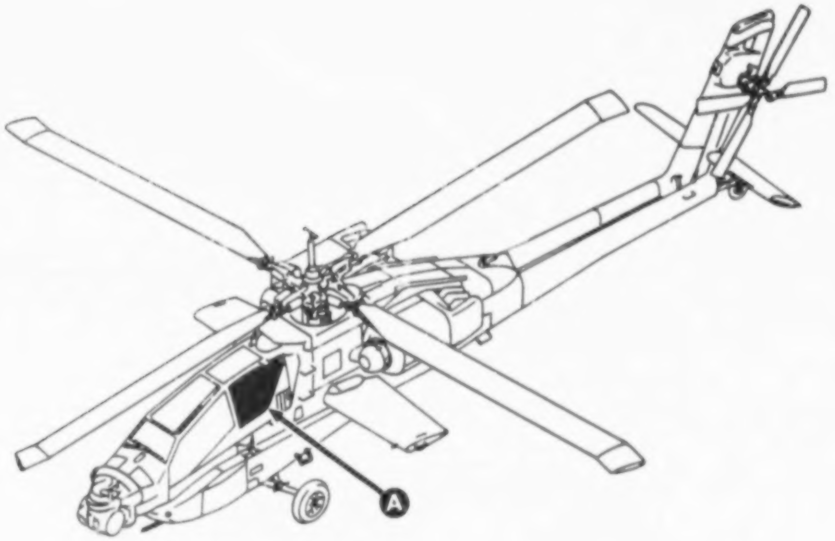
9-27-2. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - PILOT STATION) - INTERCONNECTION DIAGRAM

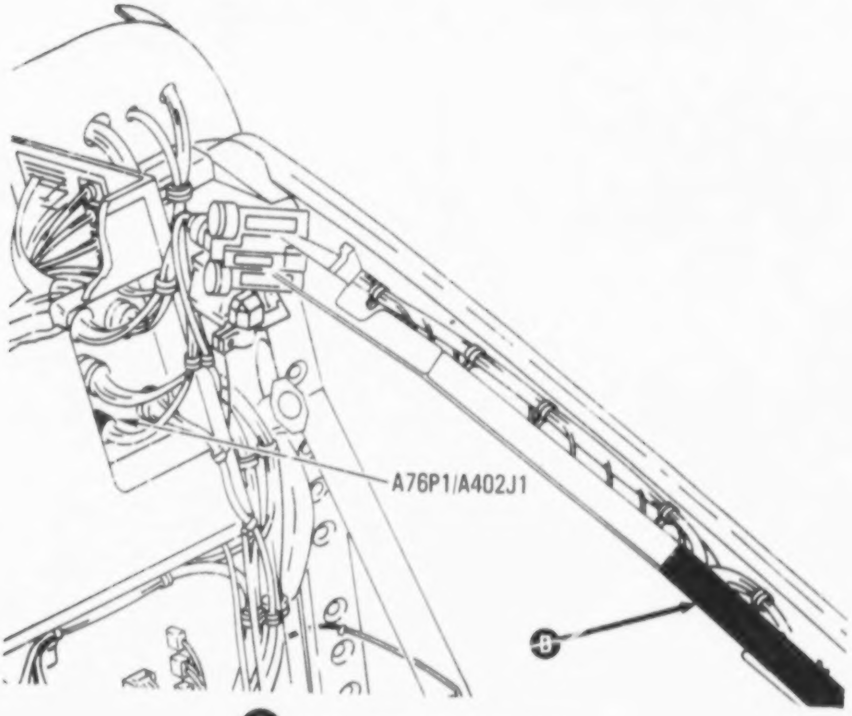


NOTES:
1. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
2. CB63 AND CB72 PROVIDE A GROUND PATH FOR REMOTE CONTROL CIRCUIT BREAKERS (A402CB1 AND A402CB2). WILL OPEN ONLY WHEN AN OVERLOAD CONDITION EXISTS IN THE RADAR WARNING SYSTEM.

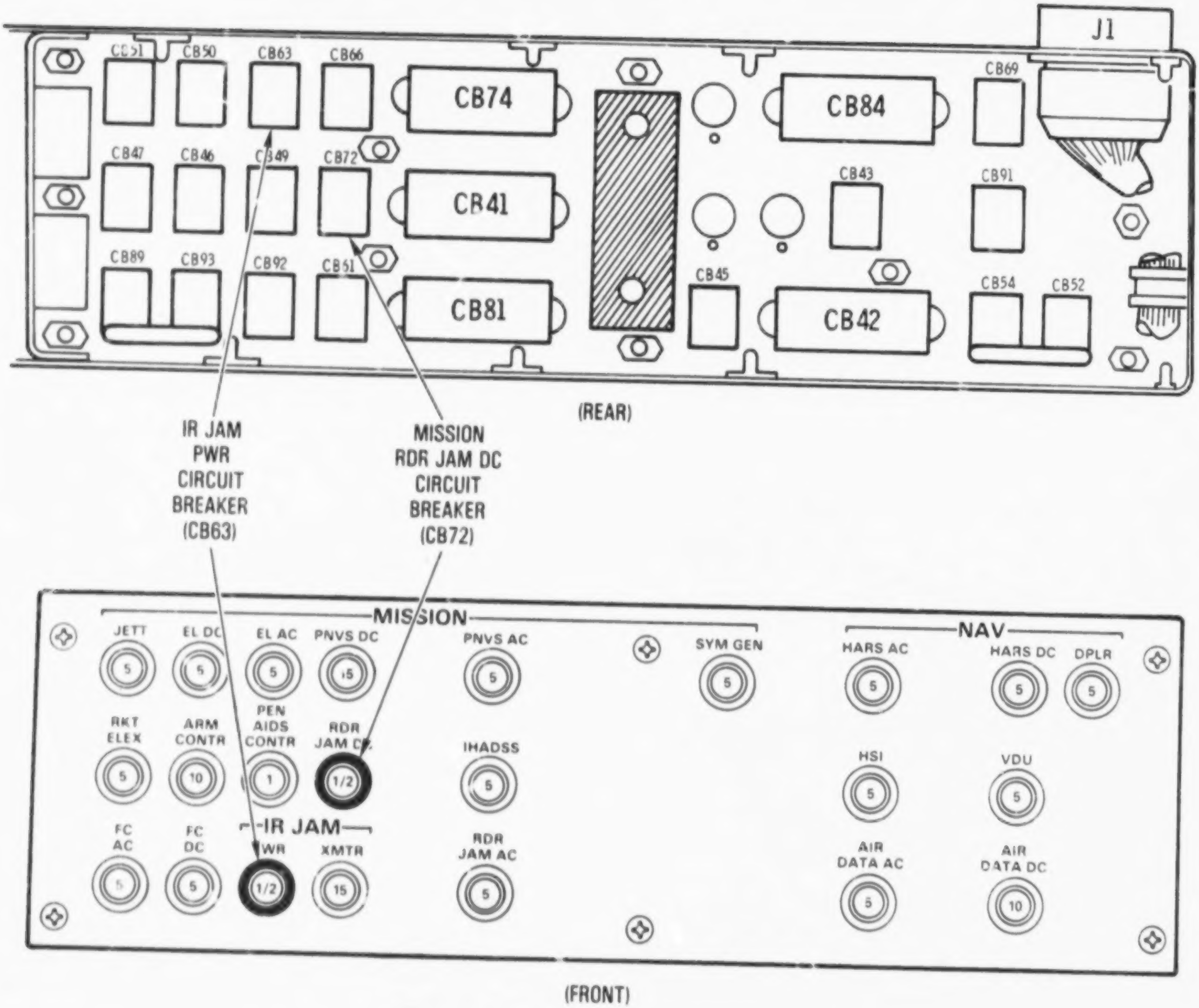
MM04/1-770C

9-27-3. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - PILOT STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION





Ⓐ PILOT STATION (LEFT SIDE)



B PILOT FORWARD CIRCUIT BREAKER PANEL

MM04/1-1194

9-27-4. OPEN EXISTS BETWEEN A76P1-50 AND -16 OR A SHORT EXISTS BETWEEN GROUND AND A76P1-16

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

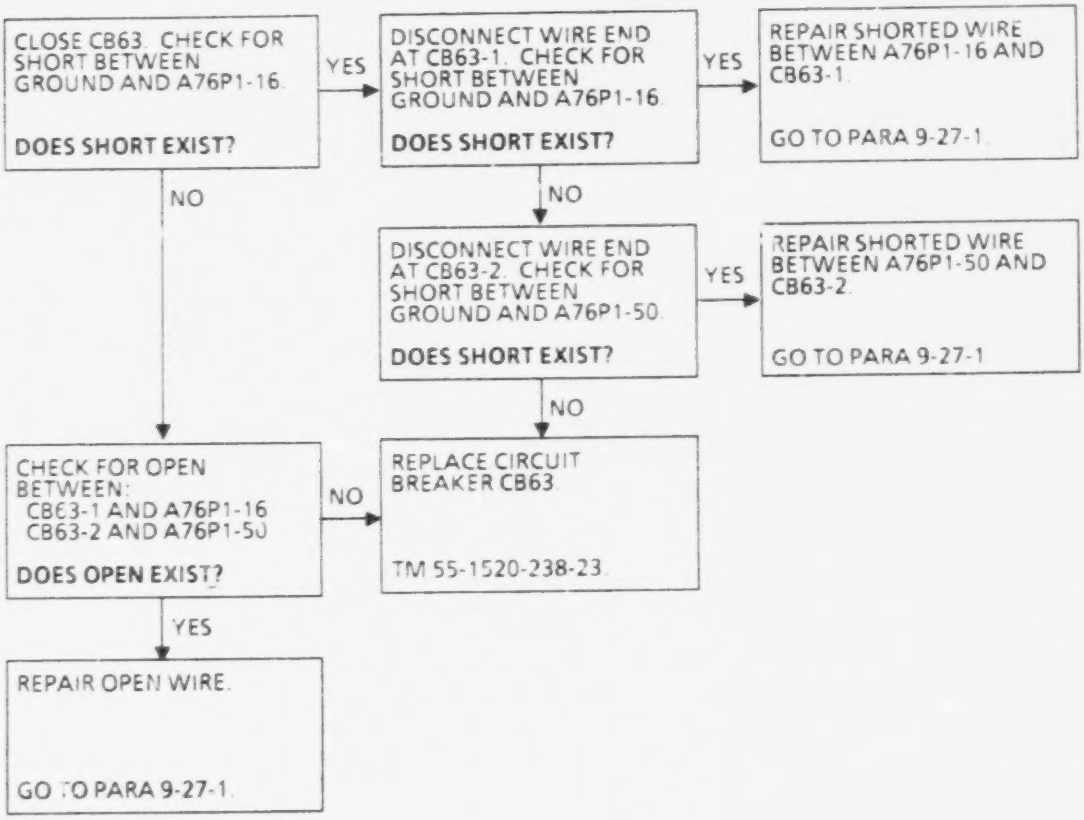
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-15-2	Pilot circuit breaker panel accessing completed


CLOSE CB63. CHECK FOR SHORT BETWEEN GROUND AND A76P1-16.
DOES SHORT EXIST?
YES
NO
DISCONNECT WIRE END AT CB63-1. CHECK FOR SHORT BETWEEN GROUND AND A76P1-16.
DOES SHORT EXIST?
YES
NO
REPAIR SHORTED WIRE BETWEEN A76P1-16 AND CB63-1.
GO TO PARA 9-27-1.
DISCONNECT WIRE END AT CB63-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-50.
DOES SHORT EXIST?
YES
NO
REPAIR SHORTED WIRE BETWEEN A76P1-50 AND CB63-2.
GO TO PARA 9-27-1
CHECK FOR OPEN BETWEEN:
CB63-1 AND A76P1-16
CB63-2 AND A76P1-50
DOES OPEN EXIST?
NO
YES
REPLACE CIRCUIT BREAKER CB63.
TM 55-1520-238-23.
REPAIR OPEN WIRE.
GO TO PARA 9-27-1.

END OF TASK

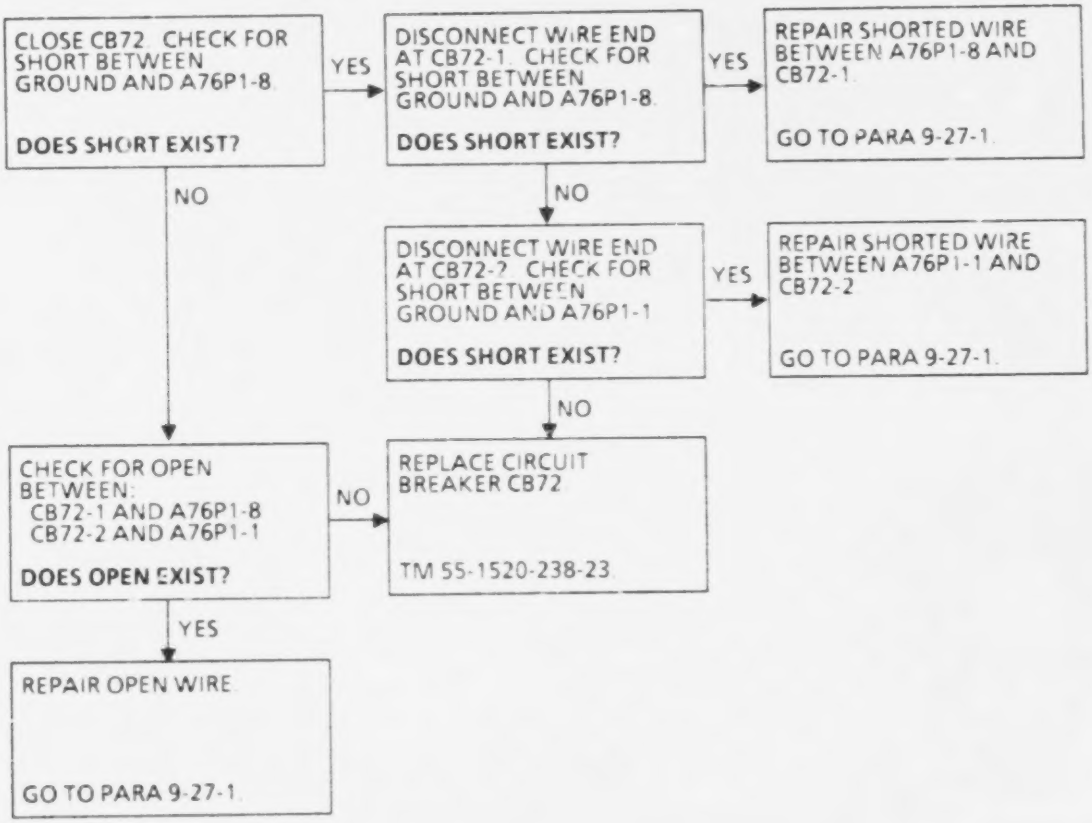
9-27-5. OPEN EXISTS BETWEEN A76P1-1 AND -8 OR A SHORT EXISTS BETWEEN GROUND AND A76P1-1

Tools: (para 9-27-4)

Personnel Required: (para 9-27-4)

References: (para 9-27-4)

Equipment Conditions: (para 9-27-4)


CLOSE CB72. CHECK FOR SHORT BETWEEN GROUND AND A76P1-8.
DOES SHORT EXIST?
YES
DISCONNECT WIRE END AT CB72-1. CHECK FOR SHORT BETWEEN GROUND AND A76P1-8.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A76P1-8 AND CB72-1.
GO TO PARA 9-27-1.
NO
NO
DISCONNECT WIRE END AT CB72-2. CHECK FOR SHORT BETWEEN GROUND AND A76P1-1.
DOES SHORT EXIST?
YES
REPAIR SHORTED WIRE BETWEEN A76P1-1 AND CB72-2.
GO TO PARA 9-27-1.
NO
CHECK FOR OPEN BETWEEN:
CB72-1 AND A76P1-8
CB72-2 AND A76P1-1
DOES OPEN EXIST?
NO
REPLACE CIRCUIT BREAKER CB72.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-27-1.

END OF TASK

9-27-6. OPEN EXISTS BETWEEN A402J1-8 AND -16

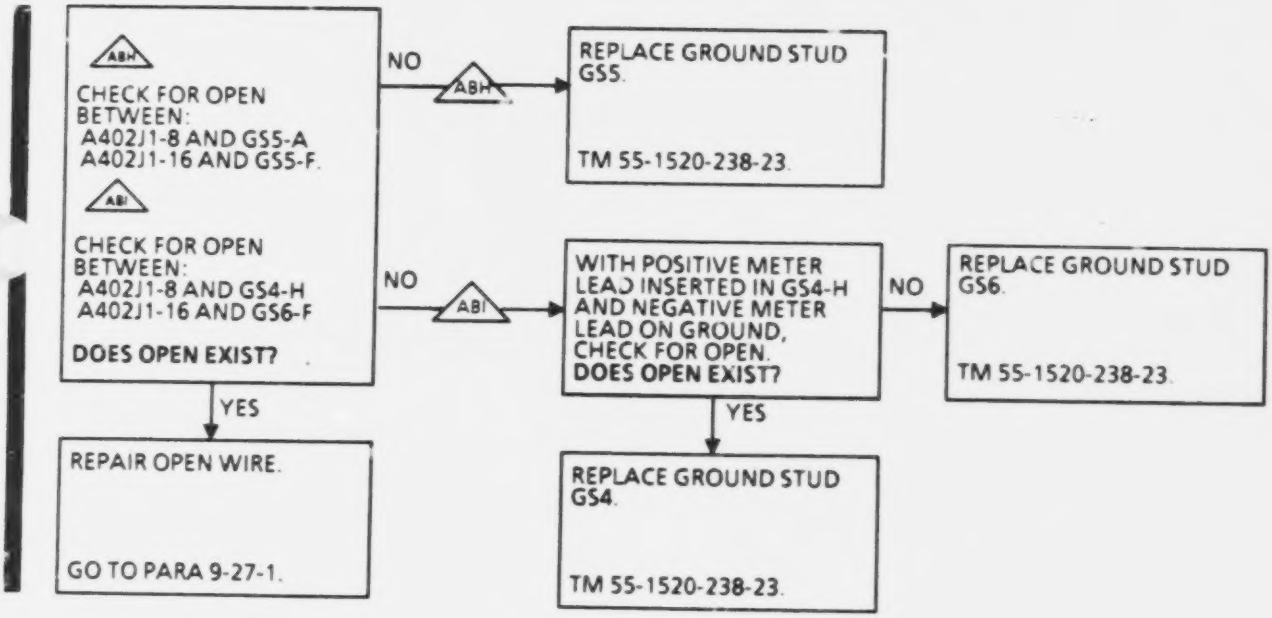
Tools: (para 9-27-4)

Personnel Required: (para 9-27-4)

References: (para 9-27-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power distribution box cover - removed



END OF TASK

9-28-1. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - CPG STATION) - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

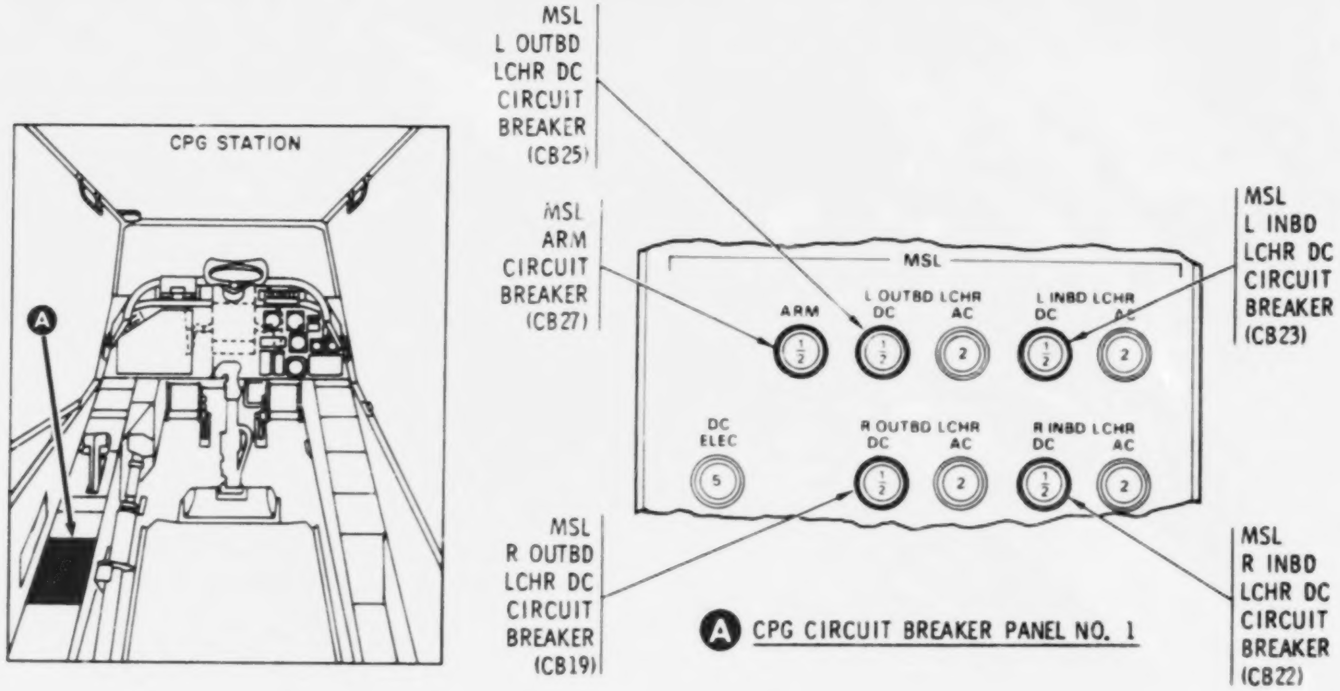
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Remove CPG circuit breaker panel No. 1


CPG STATION
A
MSL L OUTBD LCHR DC CIRCUIT BREAKER (CB25)
MSL ARM CIRCUIT BREAKER (CB27)
MSL
ARM
L OUTBD LCHR DC AC
L INBD LCHR DC AC
1/2
2
DC ELEC
5
R OUTBD LCHR DC AC
R INBD LCHR DC AC
MSL L INBD LCHR DC CIRCUIT BREAKER (CB23)
MSL R OUTBD LCHR DC CIRCUIT BREAKER (CB19)
MSL R INBD LCHR DC CIRCUIT BREAKER (CB22)
A CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1018B

A. Open all CPG DC ground circuit breakers.

B. Complete operational check as follows:

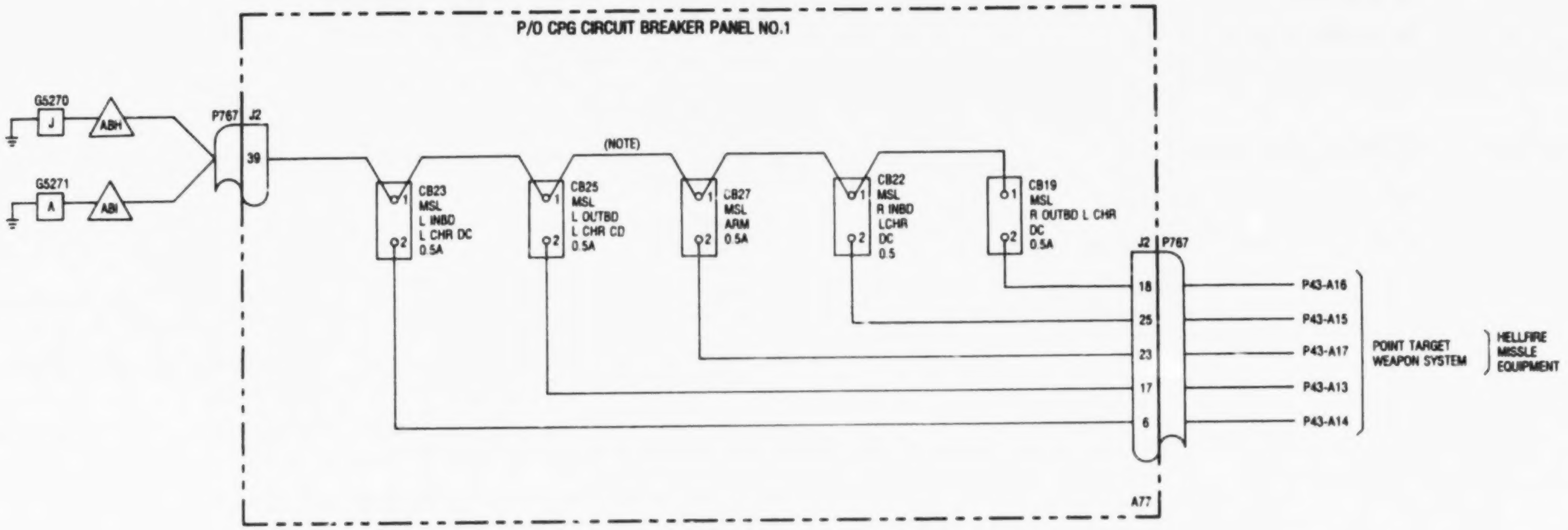
TASK	RESULT
1. Disconnect P767.	
2. Check for short between ground and A77J2-39.	If short exists, go to para 9-28-4.
3. Check for short between ground and A77J2-6.	If short exists, go to para 9-28-5.
4. Check for short between ground and A77J2-17.	If short exists, go to para 9-28-6.
5. Check for short between ground and A77J2-23.	If short exists, go to para 9-28-7.
6. Check for short between ground and A77J2-25.	If short exists, to to para 9-28-8.
7. Check for short between ground and A77J2-18.	If short exists, go to para 9-28-9.
8. Close all CPG DC ground circuit breakers.	
9. Check for continuity to seeker No. 2 between A77J2-39 and -6.	If continuity does not exist, go to para 9-28-5.
10. Check for continuity to seeker No. 1 between A77J2-39 and -17.	If continuity does not exist, go to para 9-28-6.
11. Check for continuity to ejector RCCB between A77J2-39 and -23.	If continuity does not exist, go to para 9-28-7.
12. Check for continuity seeker No. 3 between A77J2-39 and -25.	If continuity does not exist, go to para 9-28-8.
13. Check for continuity to seeker No. 4 between A77J2-39 and -18.	If continuity does not exist, go to para 9-28-9.
14. Check for continuity between ground and P767-39.	If continuity does not exist, go to para 9-28-10.

C. Reconnect P767.

D. Reinstall CPG circuit breaker panel No. 1 (TM 55-1520-238-23).

END OF TASK

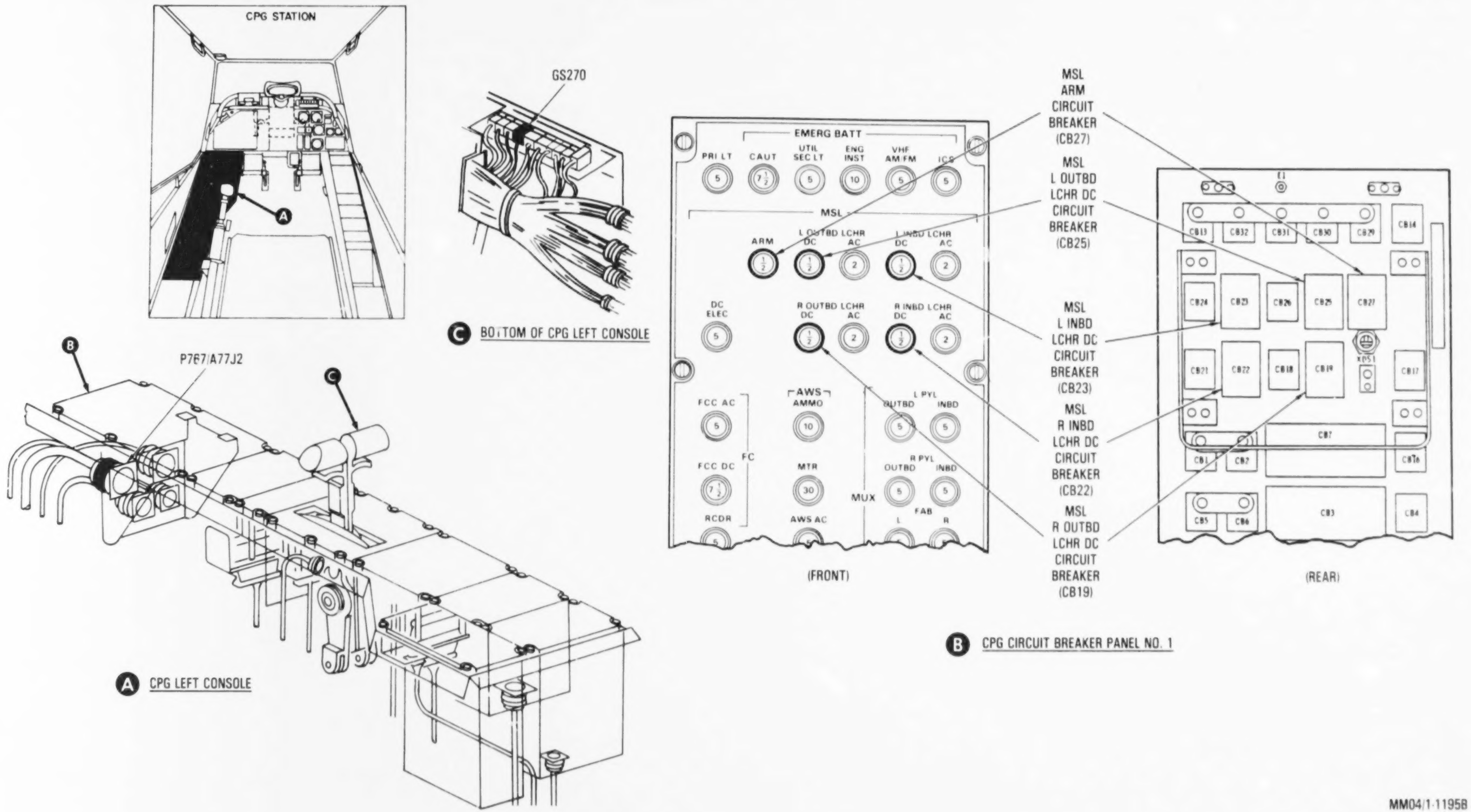
9-28-2. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - CPG STATION) - INTERCONNECTION DIAGRAM



NOTE:
DC GROUND CIRCUIT BREAKERS PROVIDE
A GROUND PATH FOR REMOTE CONTROLLED
CIRCUIT BREAKERS (RCCB) AND WILL OPEN ONLY
IF AN OVERLOAD CONDITION EXISTS THROUGH
THE RCCB.

MM04/1-771B

9-28-3. CIRCUIT PROTECTION SYSTEM (DC GROUND CIRCUIT BREAKERS - CPG STATION) - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



Ⓒ BOTTOM OF CPG LEFT CONSOLE

Ⓐ CPG LEFT CONSOLE

Ⓑ CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1195B

9-28-4. SHORT EXISTS - BETWEEN GROUND AND A77J2-39

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

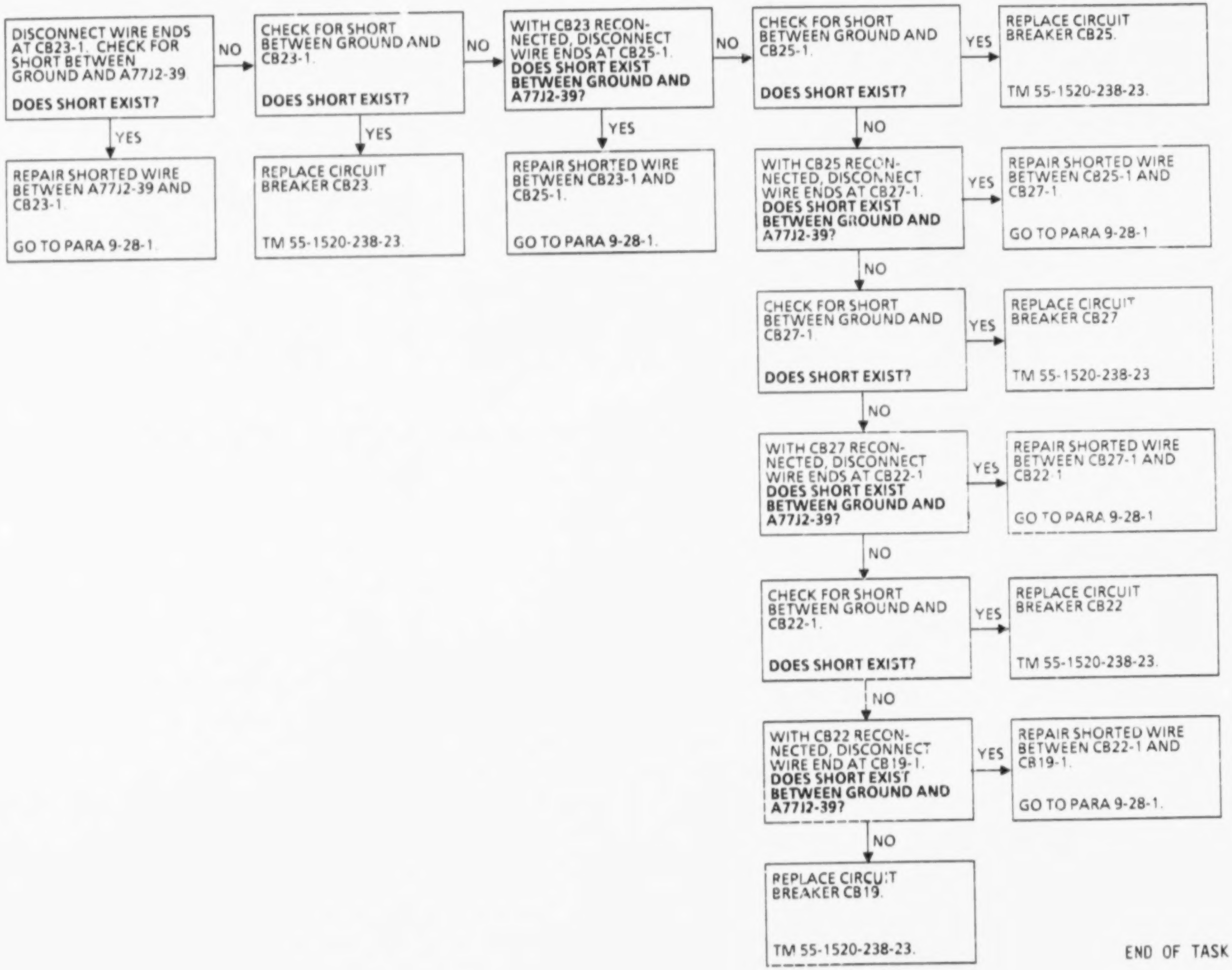
68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-27-1	All DC ground circuit breakers - CPG station open



DISCONNECT WIRE ENDS AT CB23-1. CHECK FOR SHORT BETWEEN GROUND AND A77J2-39. **DOES SHORT EXIST?**

YES: REPAIR SHORTED WIRE BETWEEN A77J2-39 AND CB23-1. GO TO PARA 9-28-1.

NO: CHECK FOR SHORT BETWEEN GROUND AND CB23-1. **DOES SHORT EXIST?**

YES: REPLACE CIRCUIT BREAKER CB23. TM 55-1520-238-23.

NO: WITH CB23 RECONNECTED, DISCONNECT WIRE ENDS AT CB25-1. **DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?**

YES: REPAIR SHORTED WIRE BETWEEN CB23-1 AND CB25-1. GO TO PARA 9-28-1.

NO: CHECK FOR SHORT BETWEEN GROUND AND CB25-1. **DOES SHORT EXIST?**

YES: REPLACE CIRCUIT BREAKER CB25. TM 55-1520-238-23.

NO: WITH CB25 RECONNECTED, DISCONNECT WIRE ENDS AT CB27-1. **DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?**

YES: REPAIR SHORTED WIRE BETWEEN CB25-1 AND CB27-1. GO TO PARA 9-28-1.

NO: CHECK FOR SHORT BETWEEN GROUND AND CB27-1. **DOES SHORT EXIST?**

YES: REPLACE CIRCUIT BREAKER CB27. TM 55-1520-238-23

NO: WITH CB27 RECONNECTED, DISCONNECT WIRE ENDS AT CB22-1. **DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?**

YES: REPAIR SHORTED WIRE BETWEEN CB27-1 AND CB22-1. GO TO PARA 9-28-1

NO: CHECK FOR SHORT BETWEEN GROUND AND CB22-1. **DOES SHORT EXIST?**

YES: REPLACE CIRCUIT BREAKER CB22. TM 55-1520-238-23.

NO: WITH CB22 RECONNECTED, DISCONNECT WIRE END AT CB19-1. **DOES SHORT EXIST BETWEEN GROUND AND A77J2-39?**

YES: REPAIR SHORTED WIRE BETWEEN CB22-1 AND CB19-1. GO TO PARA 9-28-1.

NO: REPLACE CIRCUIT BREAKER CB19. TM 55-1520-238-23.

END OF TASK

9-28-5. CONTINUITY BETWEEN A77J2-39 AND -6 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 2 EXISTS BETWEEN GROUND AND A77J2-6

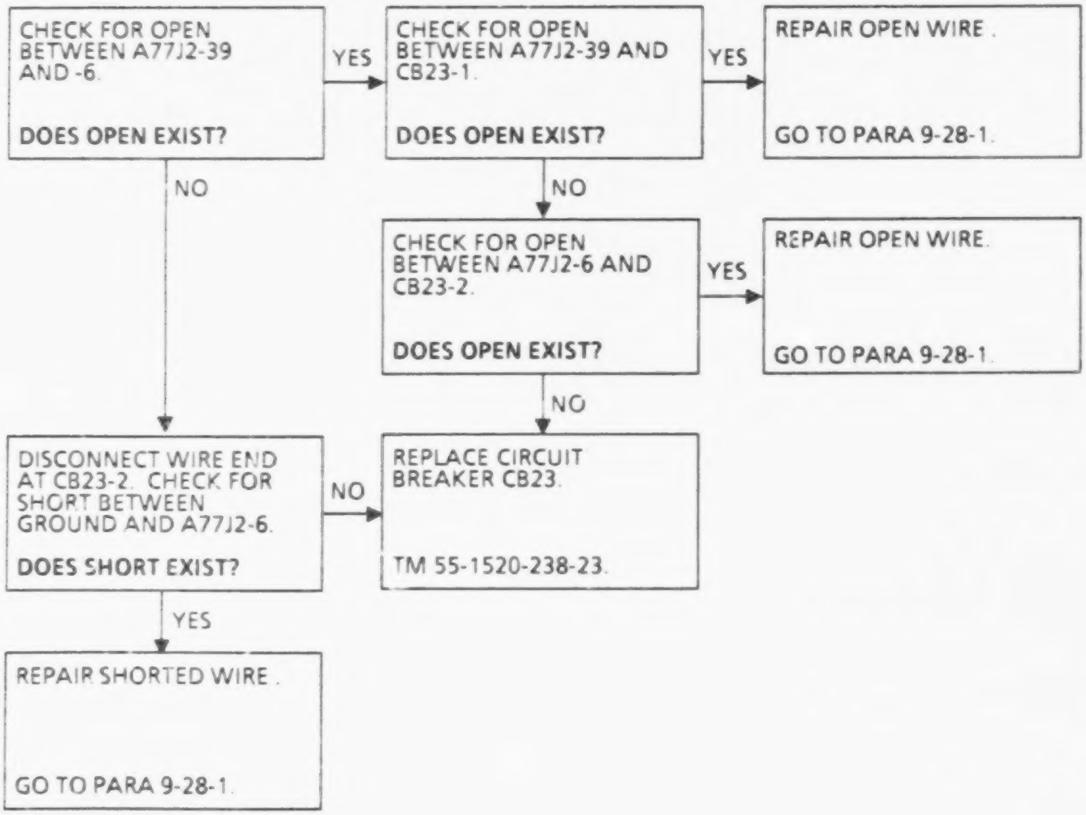
Tools: (para 9-28-4)

Personnel Required: (para 9-28-4)

References: (para 9-28-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN A77J2-39 AND -6.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB23-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE .
GO TO PARA 9-28-1.
NO
NO
CHECK FOR OPEN BETWEEN A77J2-6 AND CB23-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
DISCONNECT WIRE END AT CB23-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-6.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB23.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE .
GO TO PARA 9-28-1.

END OF TAS

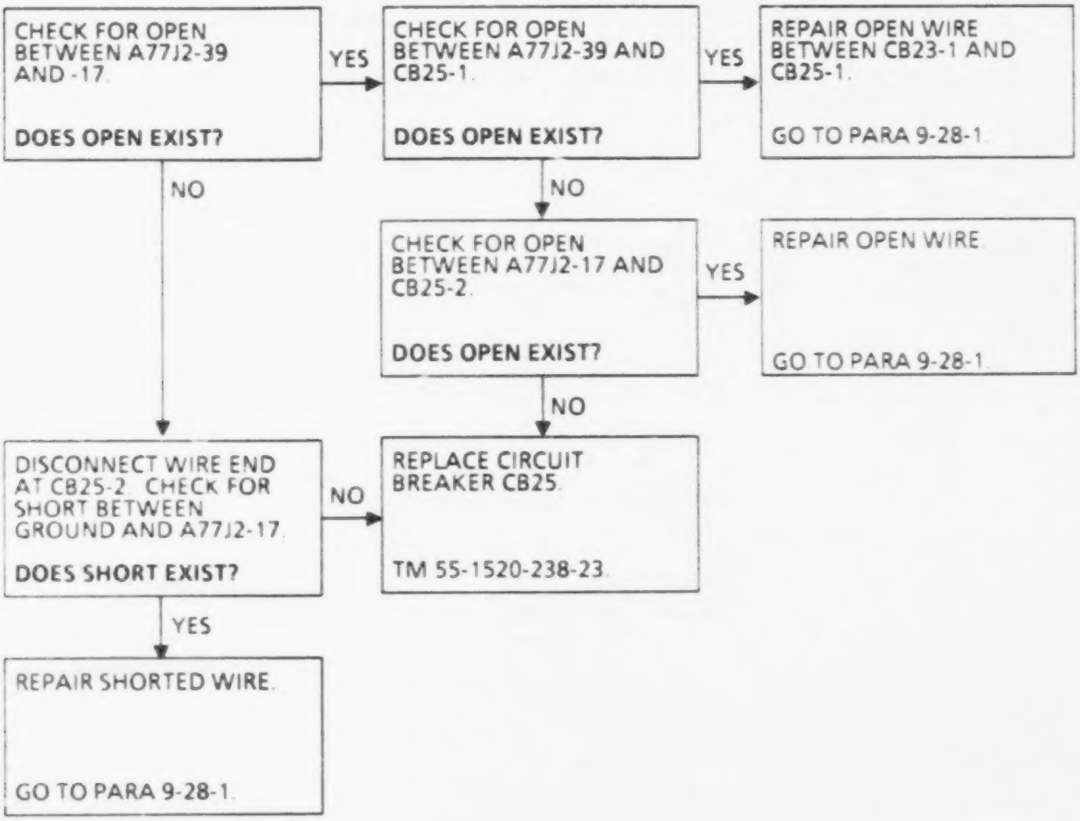
9-28-6. CONTINUITY BETWEEN A77J2-39 AND -17 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 1 EXISTS BETWEEN GROUND AND A77J2-17

Tools: (para 9-28-4)

Personnel Required: (para 9-28-4)

References: (para 9-28-4)

Equipment Conditions: (para 9-28-5)


CHECK FOR OPEN BETWEEN A77J2-39 AND -17.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB25-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB23-1 AND CB25-1.
GO TO PARA 9-28-1.
NO
NO
CHECK FOR OPEN BETWEEN A77J2-17 AND CB25-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
DISCONNECT WIRE END AT CB25-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-17.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB25.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-28-1.

END OF TASK

9-28-7. CONTINUITY BETWEEN A77J2-39 AND -20 - DOES NOT EXIST OR SHORT TO EJECTOR RCCB EXISTS BETWEEN GROUND AND A77J2-23

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

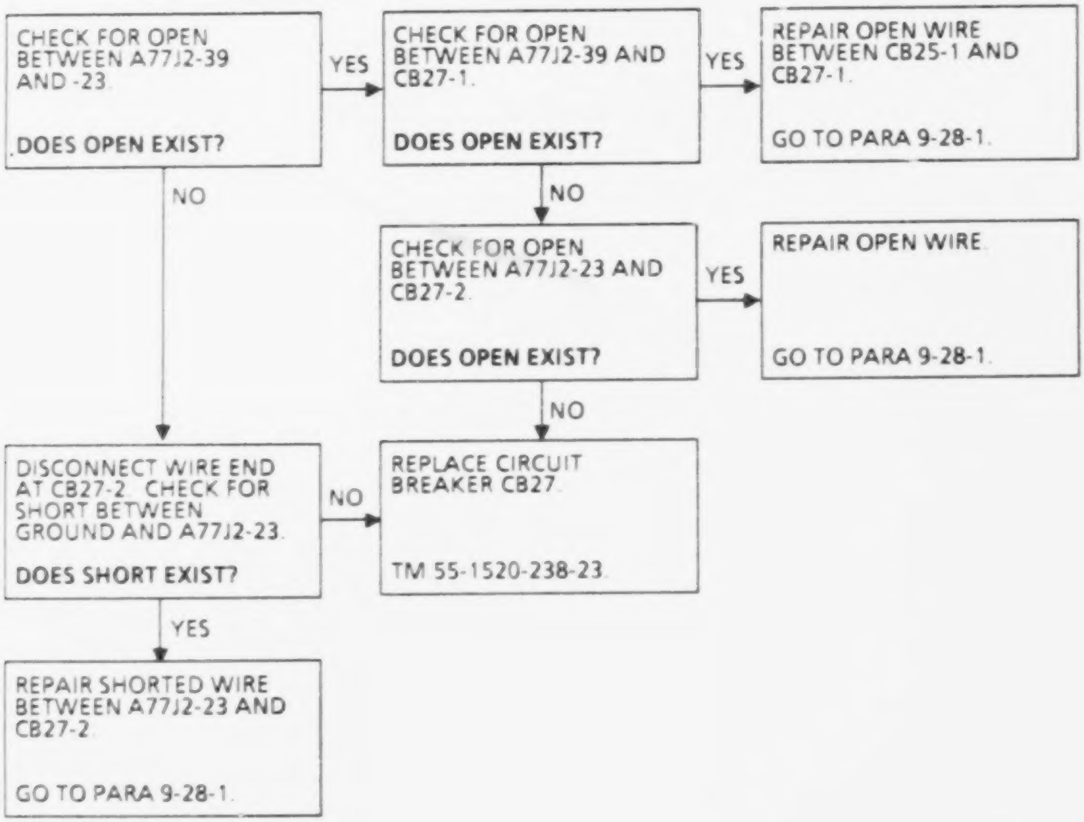
68F10 Aircraft Electrician

References:

TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed


CHECK FOR OPEN BETWEEN A77J2-39 AND -23.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB27-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB25-1 AND CB27-1.
GO TO PARA 9-28-1.
NO
NO
CHECK FOR OPEN BETWEEN A77J2-23 AND CB27-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
DISCONNECT WIRE END AT CB27-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-23.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB27.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN A77J2-23 AND CB27-2.
GO TO PARA 9-28-1.

END OF TASK

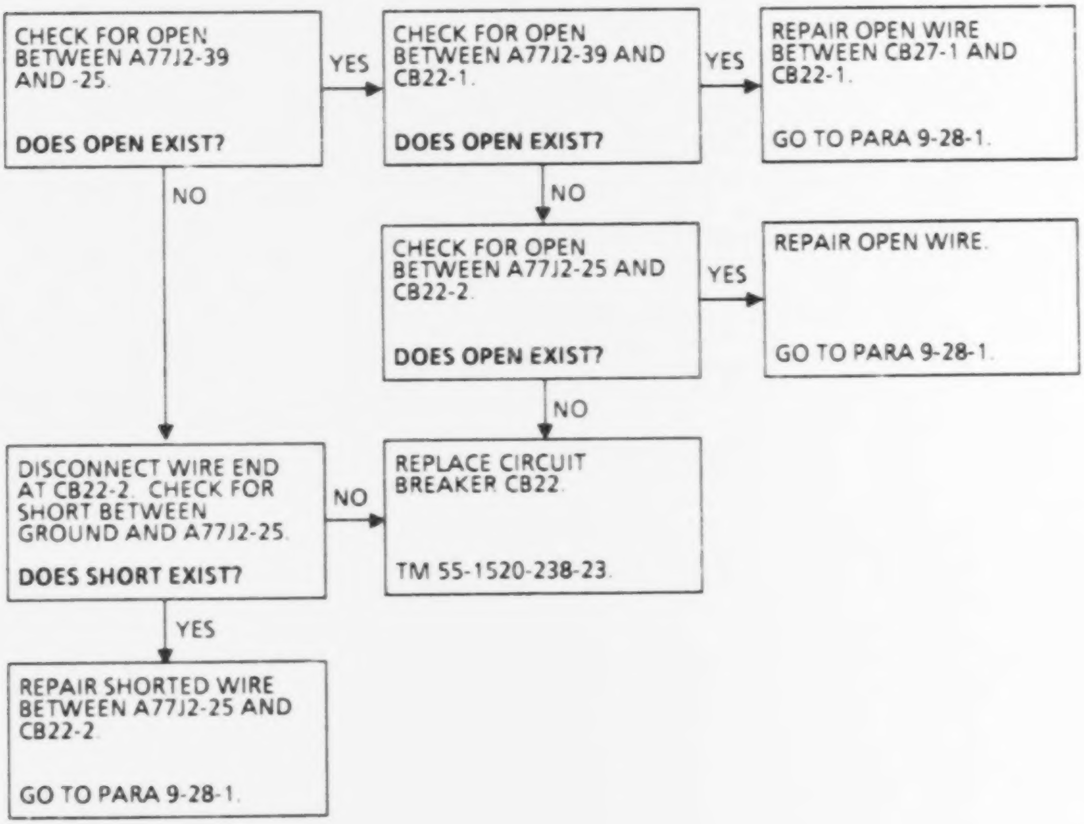
9-28-8. CONTINUITY BETWEEN A77J2-39 AND -25 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 3 EXISTS BETWEEN GROUND AND A77J2-25

Tools: (para 9-28-7)

Personnel Required: (para 9-28-7)

References: (para 9-28-7)

Equipment Conditions: (para 9-28-7)


CHECK FOR OPEN BETWEEN A77J2-39 AND -25.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB22-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB27-1 AND CB22-1.
GO TO PARA 9-28-1.
NO
NO
CHECK FOR OPEN BETWEEN A77J2-25 AND CB22-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
DISCONNECT WIRE END AT CB22-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-25.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB22.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN A77J2-25 AND CB22-2.
GO TO PARA 9-28-1.

END OF TAS

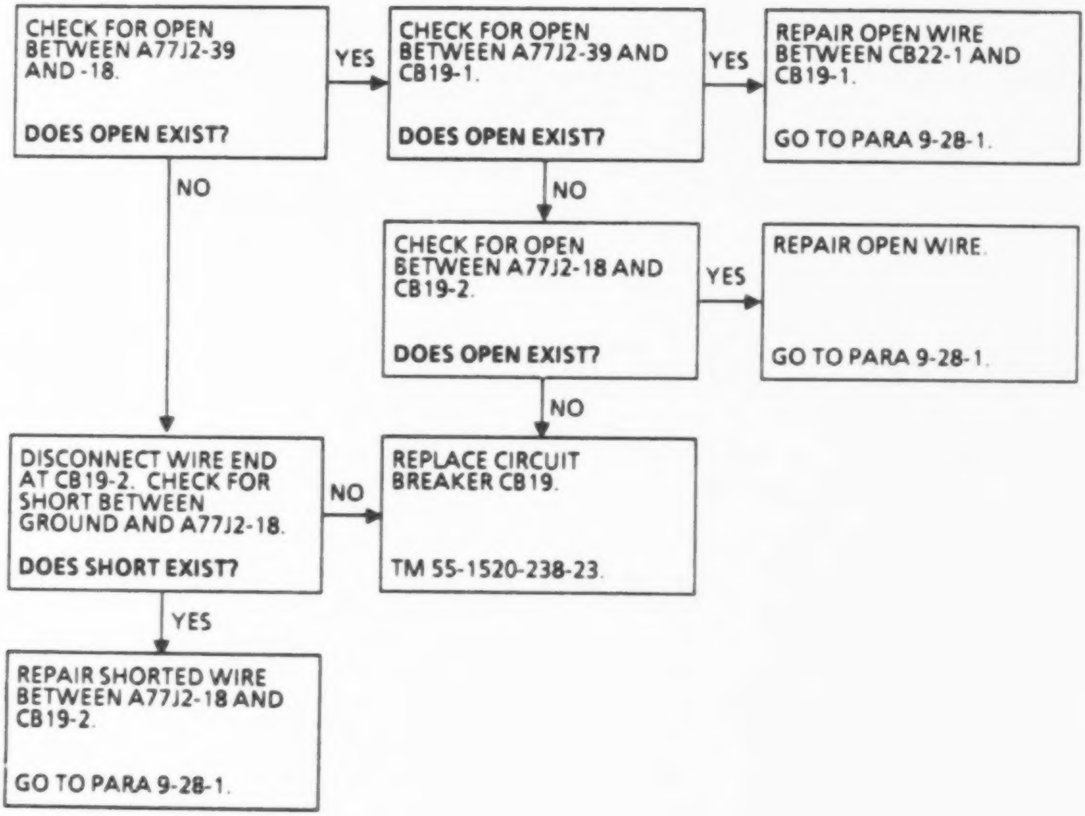
9-28-9. CONTINUITY BETWEEN A77J2-39 AND -18 - DOES NOT EXIST OR SHORT TO LAUNCHER SEEKER NO. 4 EXISTS BETWEEN GROUND AND A77J2-18

Tools: (para 9-28-7)

Personnel Required: (para 9-28-7)

References: (para 9-28-7)

Equipment Conditions: (para 9-28-7)


CHECK FOR OPEN BETWEEN A77J2-39 AND -18.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN A77J2-39 AND CB19-1.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE BETWEEN CB22-1 AND CB19-1.
GO TO PARA 9-28-1.
NO
NO
CHECK FOR OPEN BETWEEN A77J2-18 AND CB19-2.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-28-1.
NO
DISCONNECT WIRE END AT CB19-2. CHECK FOR SHORT BETWEEN GROUND AND A77J2-18.
DOES SHORT EXIST?
NO
REPLACE CIRCUIT BREAKER CB19.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE BETWEEN A77J2-18 AND CB19-2.
GO TO PARA 9-28-1.

END OF TASK

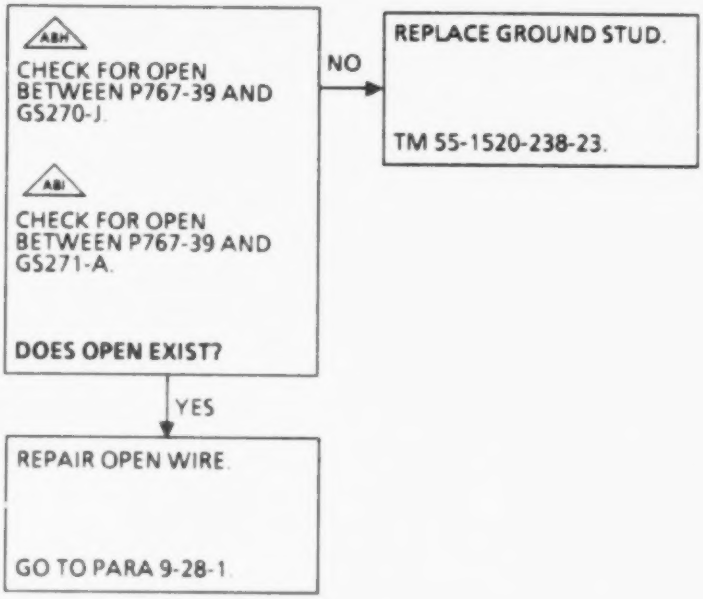
9-28-10. CONTINUITY DOES NOT EXIST BETWEEN GROUND AND P767-39

Tools: (para 9-28-7)

Personnel Required: (para 9-28-7)

References: (para 9-28-7)

Equipment Conditions: (para 9-28-7)



END OF TASK

9-29-1. CIRCUIT BREAKER EDGE-LIGHT PANEL - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

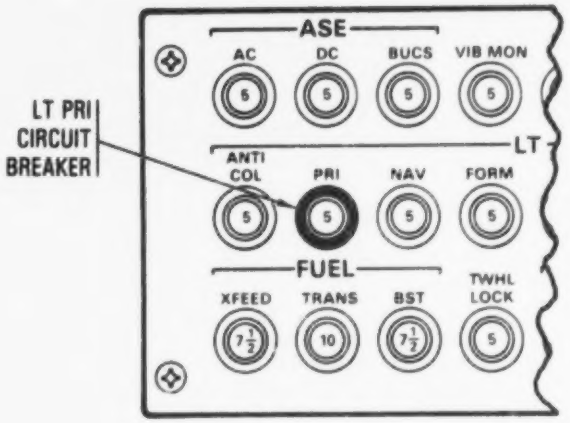
68F10 Aircraft Electrician

References:

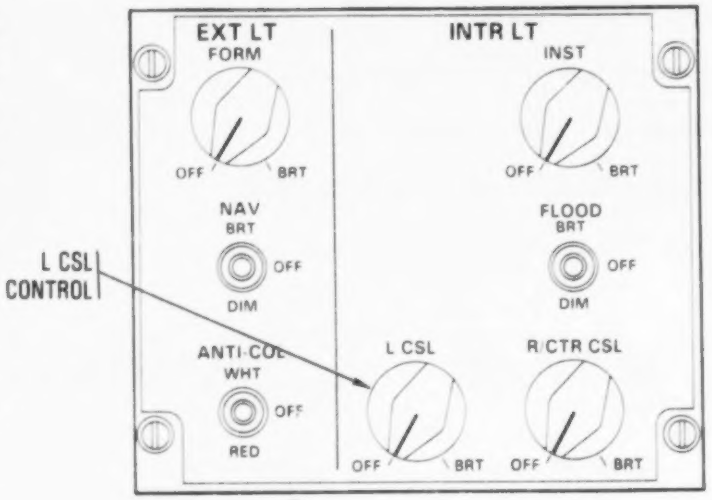
TM 55-1520-238-23

Equipment Conditions:

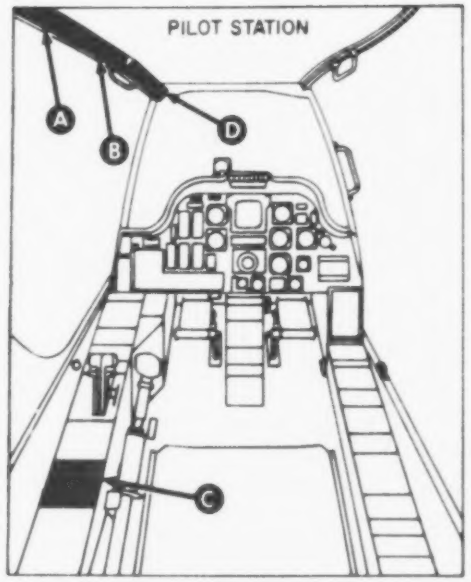
Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

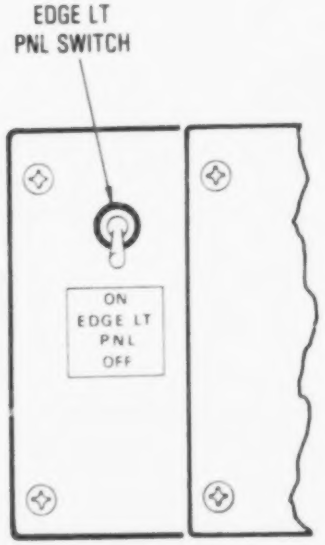


B PILOT CENTER CIRCUIT BREAKER PANEL

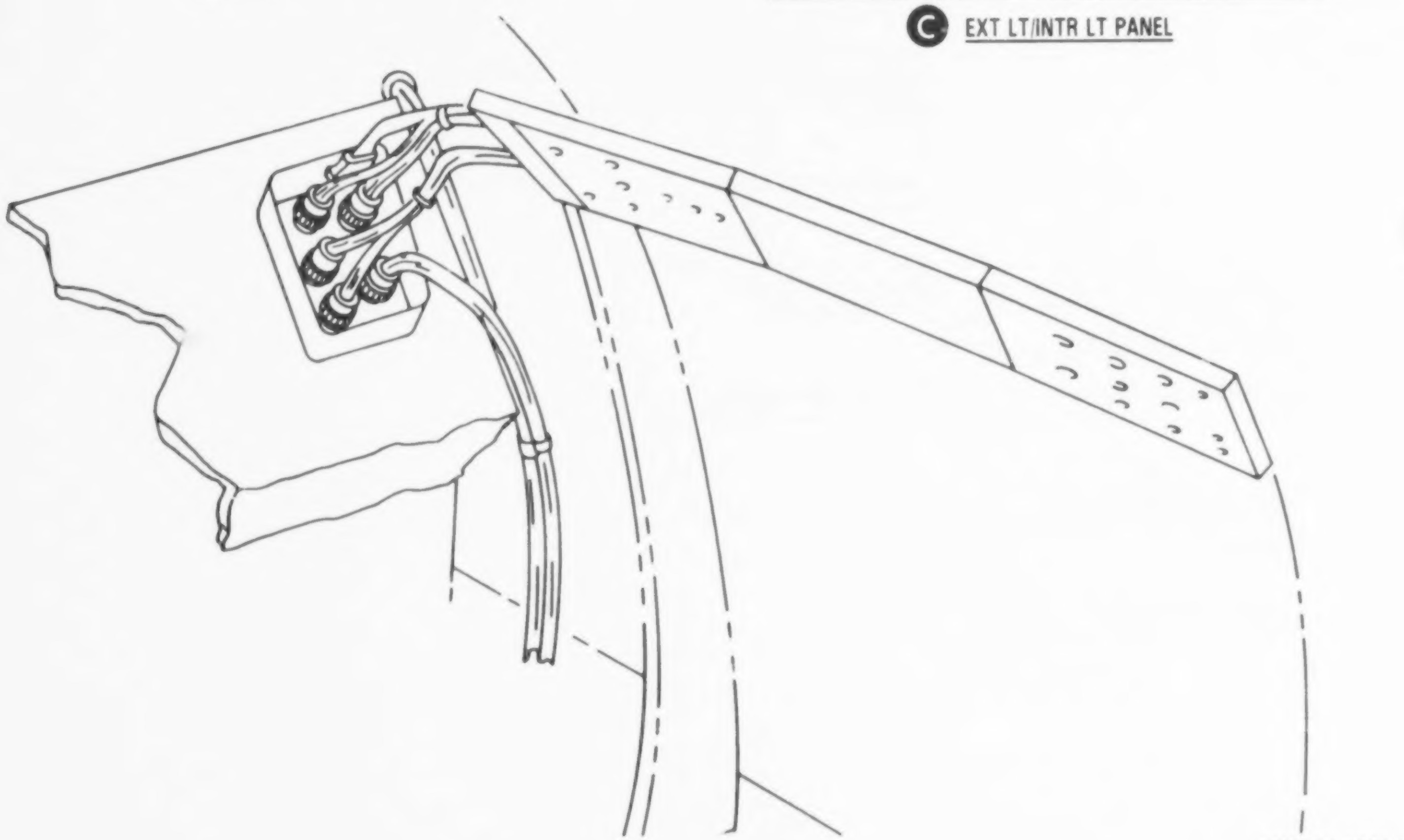


C EXT LT/INTR LT PANEL





A PILOT AFT CIRCUIT BREAKER PANEL



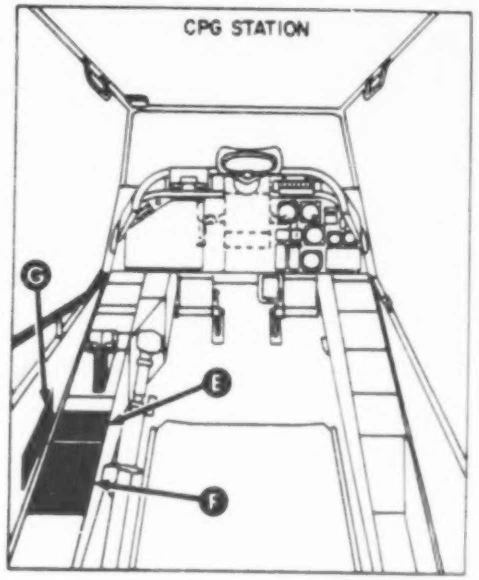
MM04/1-1231-1

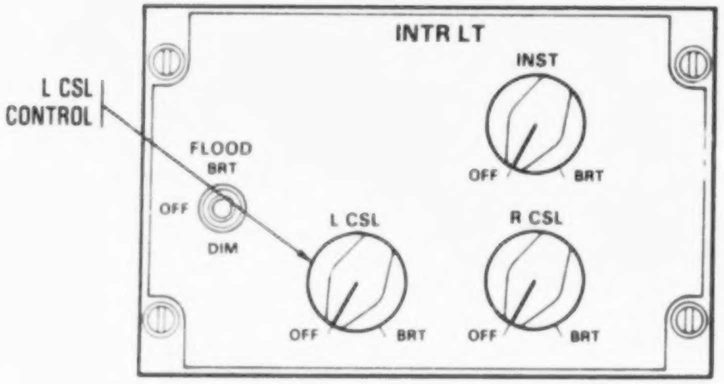
D PILOT CIRCUIT BREAKER EDGE-LIGHT PANELS

GO TO NEXT PAGE

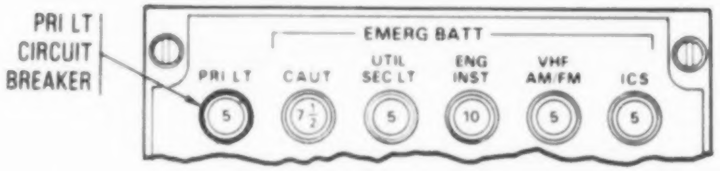
9-29-1. CIRCUIT BREAKER EDGE-LIGHT PANEL - OPERATIONAL CHECK (cont)

9-29-1

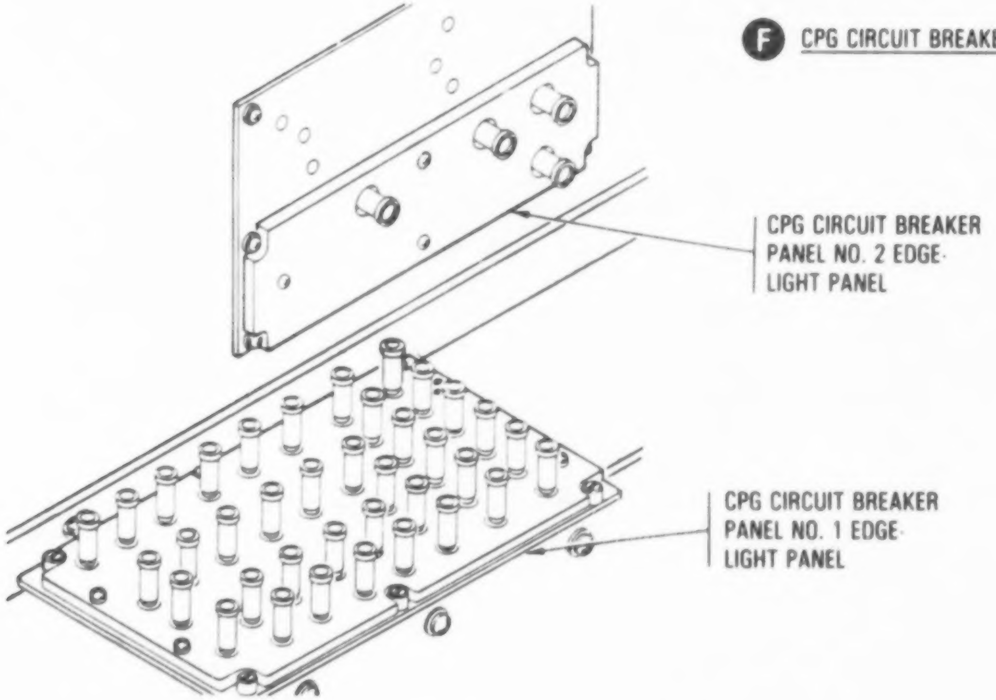




E INTR LT PANEL



F CPG CIRCUIT BREAKER PANEL NO. 1


CPG CIRCUIT BREAKER PANEL NO. 2 EDGE-LIGHT PANEL
CPG CIRCUIT BREAKER PANEL NO. 1 EDGE-LIGHT PANEL

G CPG CIRCUIT BREAKER EDGE-LIGHT PANELS

MM04/1231-2A

A. On ELEC PWR panel, set BATT/EXT PWR switch to EXT PWR switch to EXT PWR.

B. Complete operational check as follows:

TASK	RESULT
1. On pilot center circuit breaker panel, check that LT PRI circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-13-1.
2. On pilot aft circuit breaker panel, set EDGE LT PNL switch to ON. On EXT LT/INTR LT panel, turn L CSL control to BRT. Check that all three circuit breaker edge-light panels are lighted.	Replace unlighted panel lamps (TM 55-1520-238-23). If all three pilot circuit breaker edge-light panels are not lighted, go to para 9-29-4.
3. On CPG circuit breaker panel No. 1, check that PRI LT circuit breaker is closed.	If circuit breaker does not stay closed, go to para 9-14-1.
4. On INTR LT panel, set L CSL control to BRT. Cehck that both CPG circuit breaker panel edge-light panels are lighted.	Replace unlighted panel lamps (TM 55-1520-238-23). If CPG circuit breaker panel no. 1 is not lighted, go to para 9-29-5. If CPG circuit breaker panel no. 2 is not lighted, go to para 9-29-6.

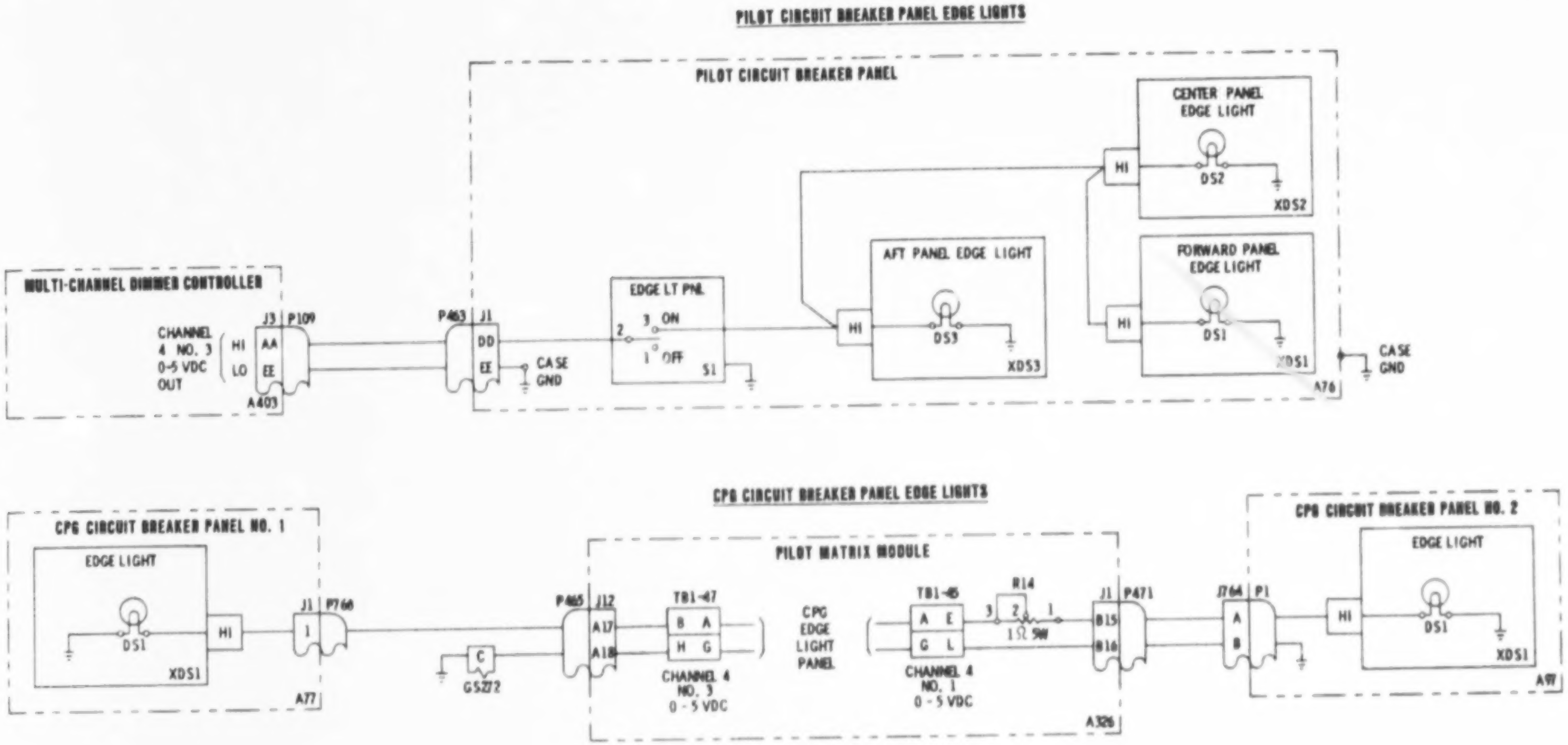
C. On pilot EXT LT/INTR LT panel set L CSL control to OFF.

D. On CPG INTR LT panel, set L CSL control to OFF.

E. Perform EXTERNAL POWER - POWER DOWN (para 9-5-3).

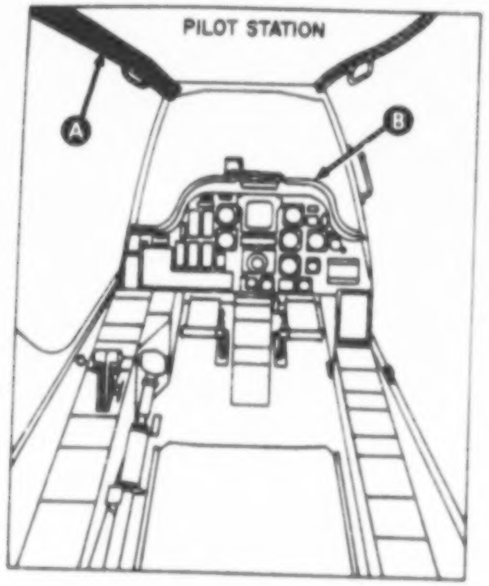
END OF TASK

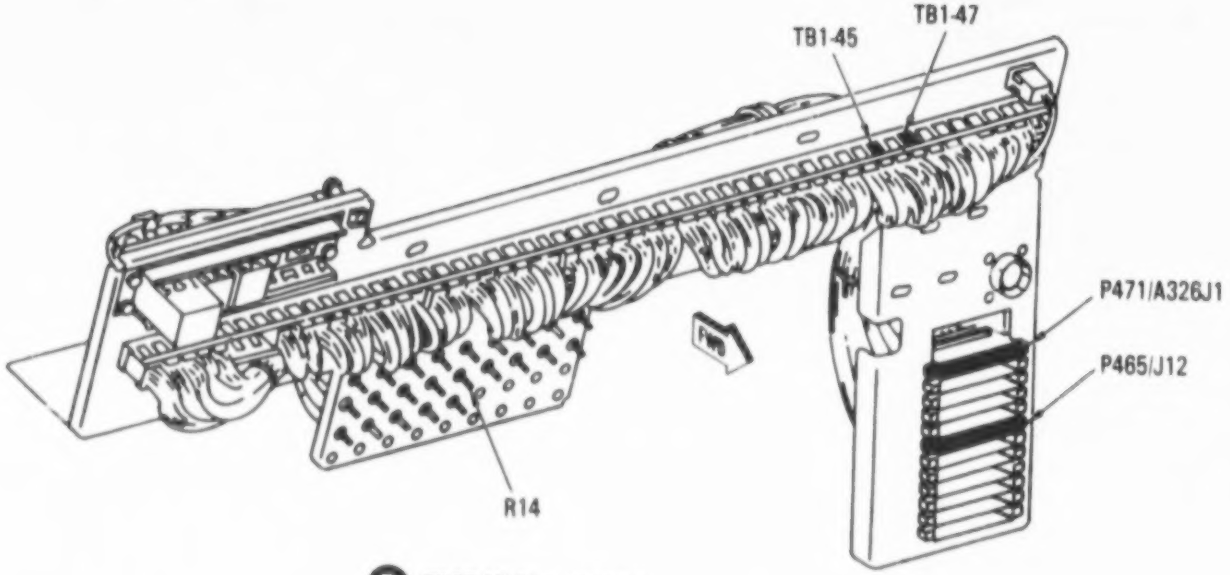
9-29-2. CIRCUIT BREAKER EDGE-LIGHT PANELS - INTERCONNECTION DIAGRAM



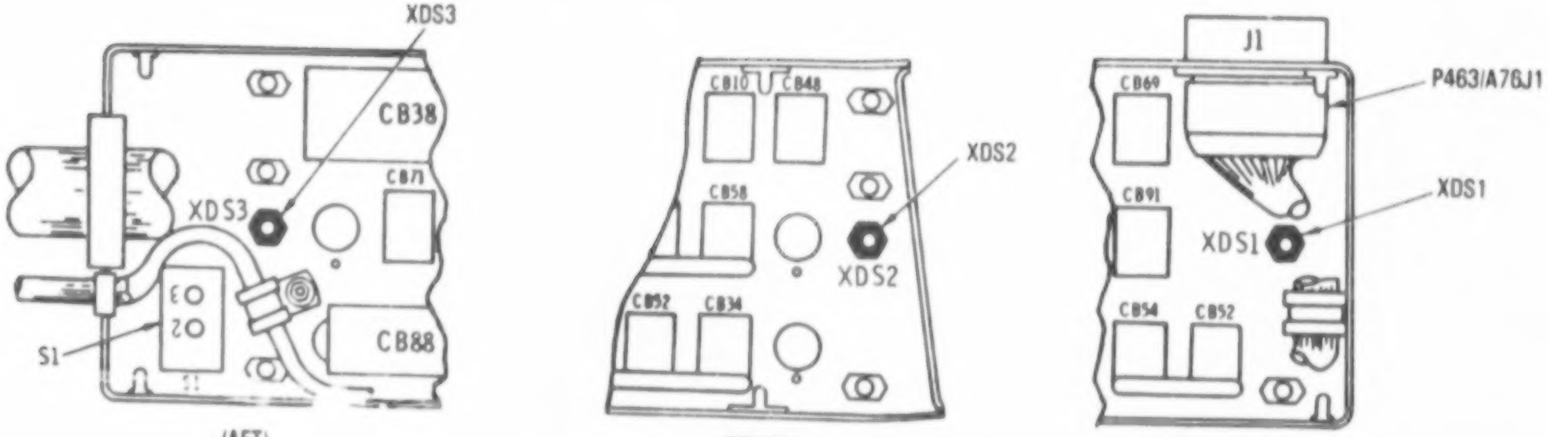
MM04/1-744

9-29-3. CIRCUIT BREAKER EDGE-LIGHT PANELS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION





B PILOT MATRIX MODULE

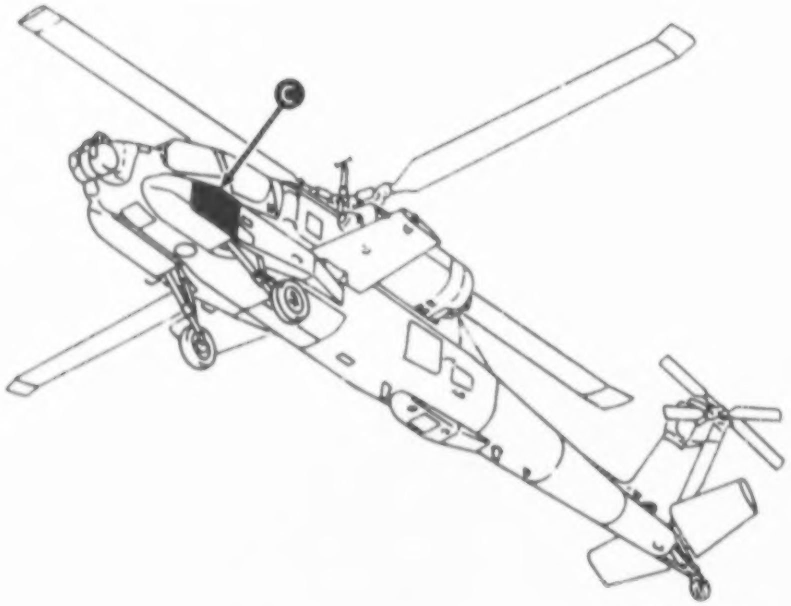


(AFT)

(CENTER)

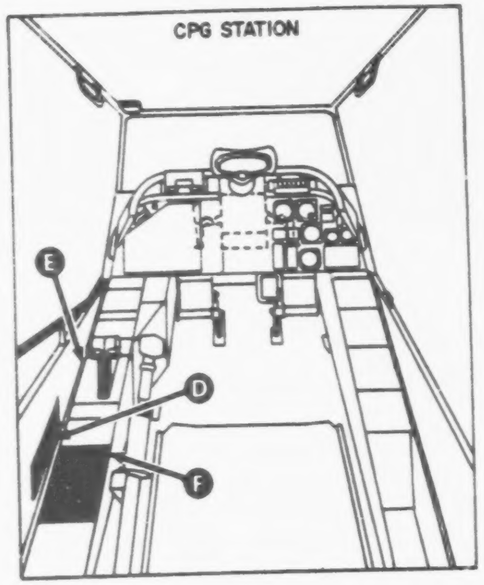
(FORWARD)

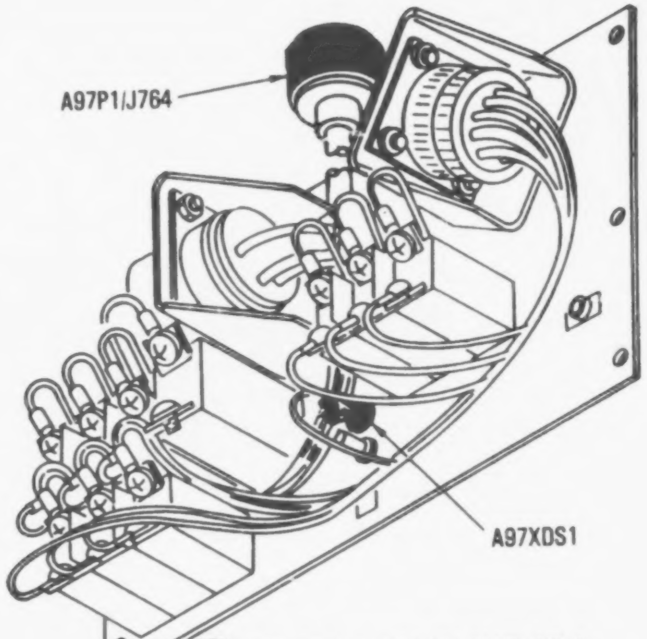
A PILOT CIRCUIT BREAKER PANEL
(REAR VIEW)



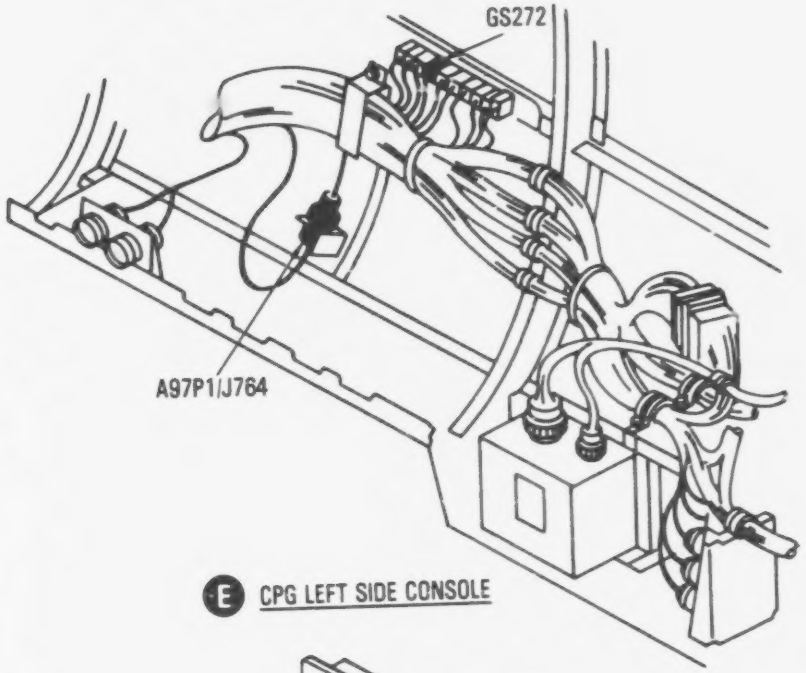
MM04/1-1232-1B

9-29-3. CIRCUIT BREAKER EDGE-LIGHT PANELS - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

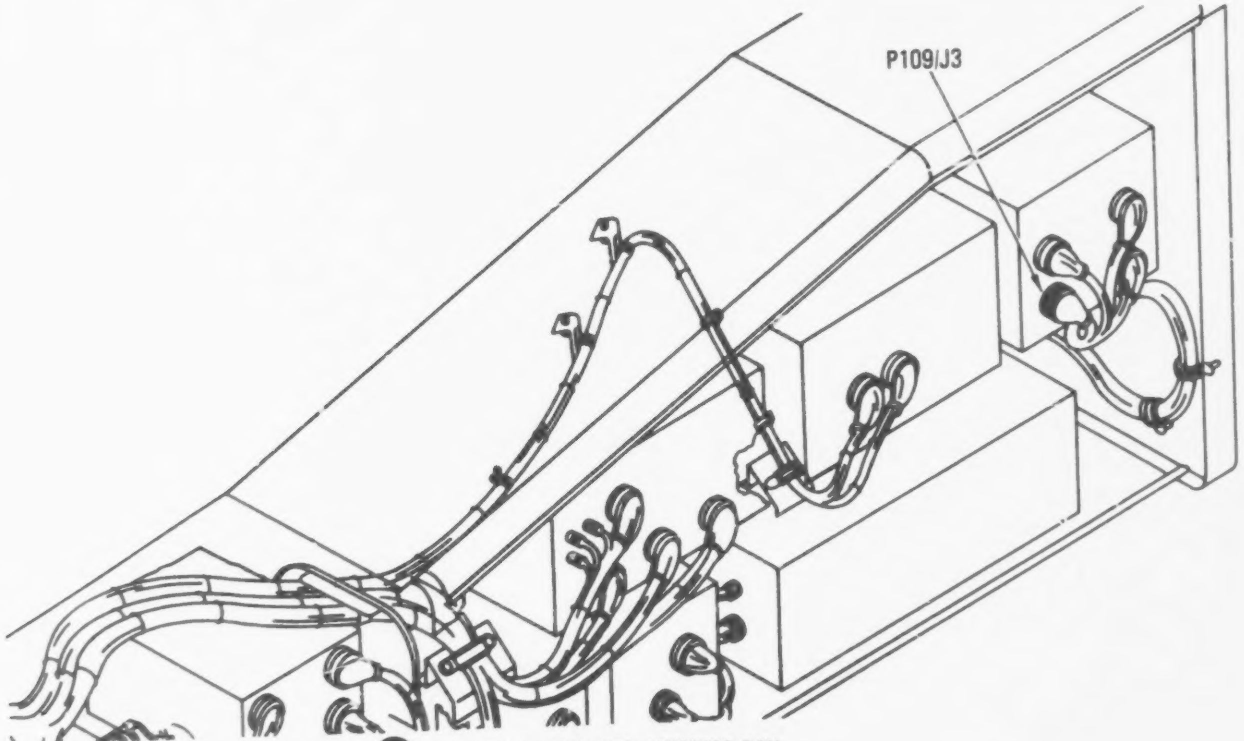




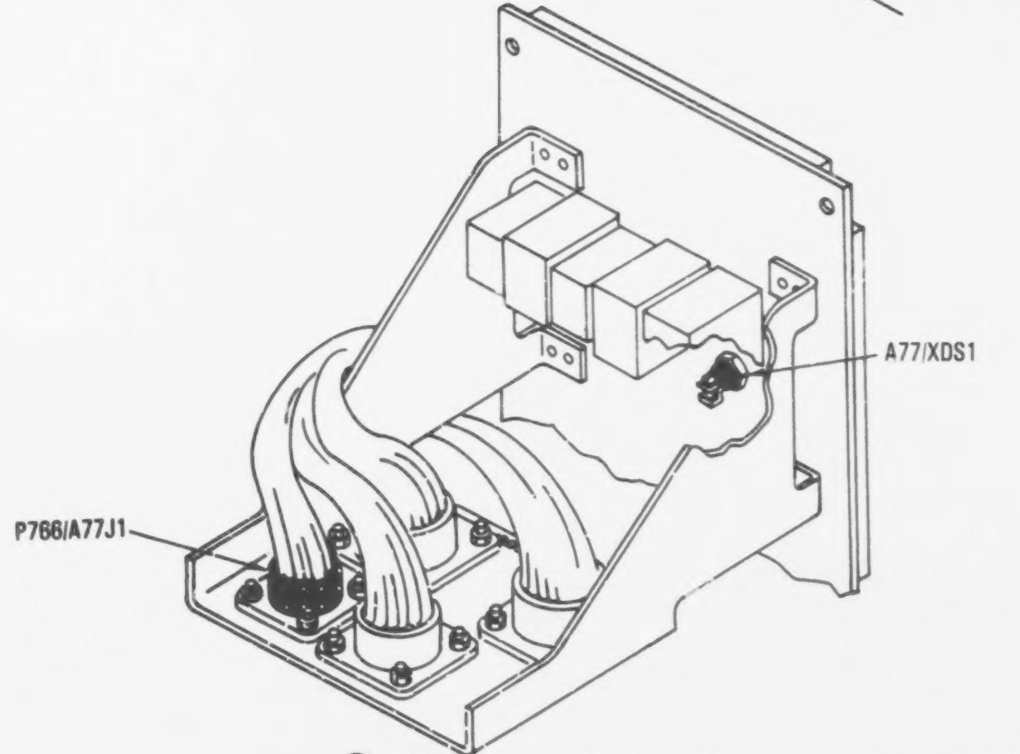
Ⓓ CPG CIRCUIT BREAKER PANEL NO. 2



Ⓔ CPG LEFT SIDE CONSOLE



Ⓒ LEFT HAND FORWARD AVIONICS BAY



Ⓕ CPG CIRCUIT BREAKER PANEL NO. 1

MM04/1-1232-2B

9-29-4. PILOT CIRCUIT BREAKER EDGE-LIGHT PANELS - DO NOT FUNCTION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

TM 55-15200-238-23

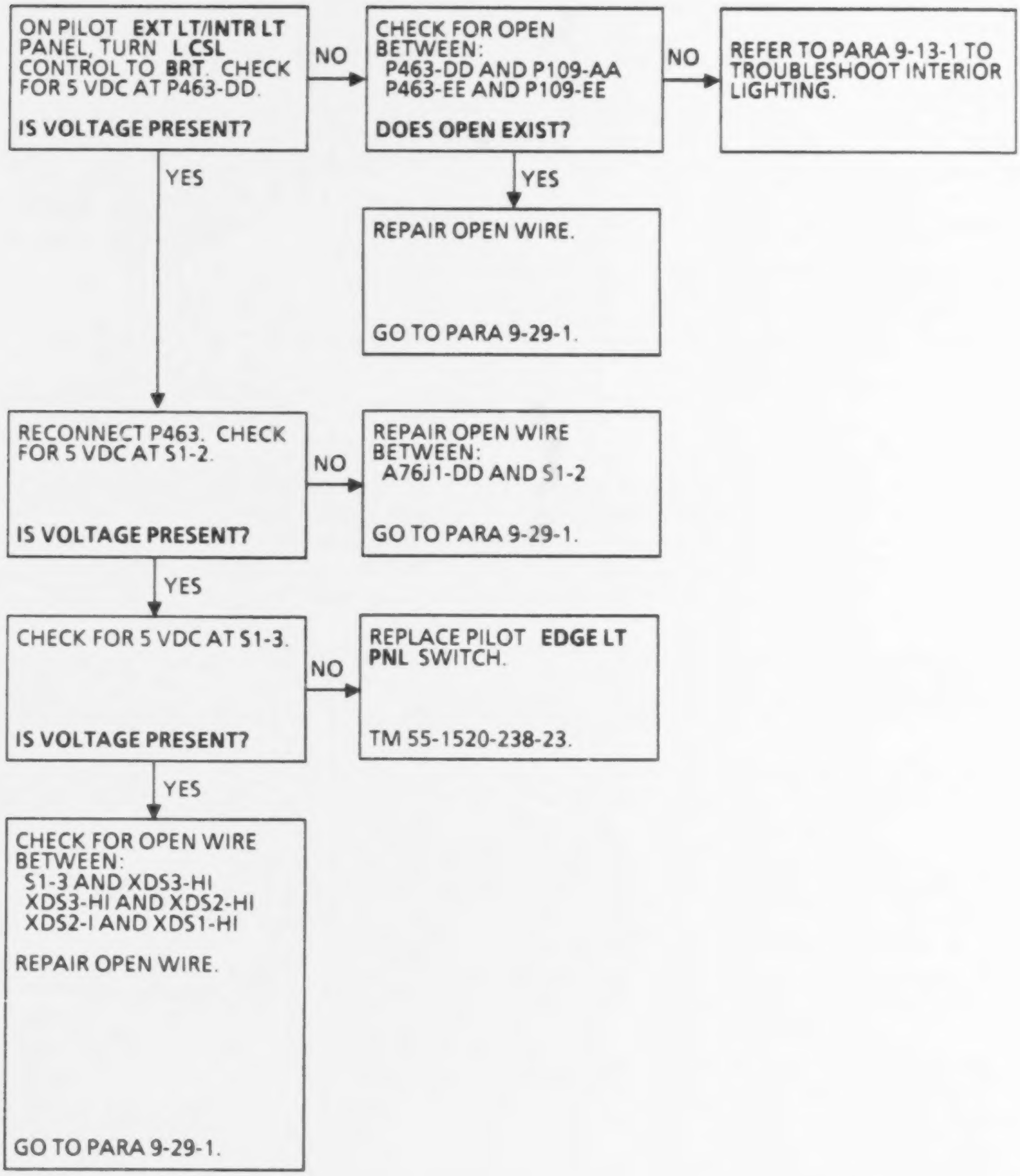
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

9-29-4



ON PILOT **EXT LT/INTR LT** PANEL, TURN **L CSL** CONTROL TO **BRT**. CHECK FOR 5 VDC AT P463-DD.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P463-DD AND P109-AA
P463-EE AND P109-EE

DOES OPEN EXIST?

REFER TO PARA 9-13-1 TO TROUBLESHOOT INTERIOR LIGHTING.

REPAIR OPEN WIRE.

GO TO PARA 9-29-1.

RECONNECT P463. CHECK FOR 5 VDC AT S1-2.

IS VOLTAGE PRESENT?

REPAIR OPEN WIRE BETWEEN:
A76J1-DD AND S1-2

GO TO PARA 9-29-1.

CHECK FOR 5 VDC AT S1-3.

IS VOLTAGE PRESENT?

REPLACE PILOT **EDGE LT PNL** SWITCH.

TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN:
S1-3 AND XDS3-HI
XDS3-HI AND XDS2-HI
XDS2-I AND XDS1-HI

REPAIR OPEN WIRE.

GO TO PARA 9-29-1.

END OF TASK

9-29-5. CPG CIRCUIT BREAKER PANEL NO. 1 EDGE-LIGHT - DOES NOT LIGHT

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

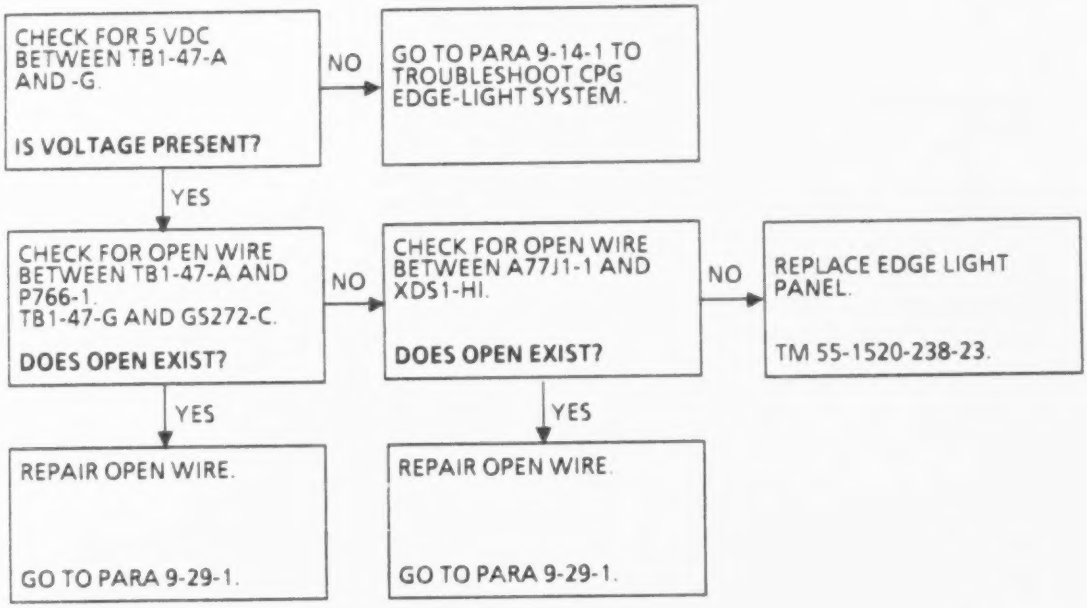
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 5 VDC BETWEEN TB1-47-A AND -G.
IS VOLTAGE PRESENT?
NO
GO TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHT SYSTEM.
YES
CHECK FOR OPEN WIRE BETWEEN TB1-47-A AND P766-1.
TB1-47-G AND GS272-C.
DOES OPEN EXIST?
NO
CHECK FOR OPEN WIRE BETWEEN A77J1-1 AND XDS1-HI.
DOES OPEN EXIST?
NO
REPLACE EDGE LIGHT PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-29-1.

END OF TASK

9-29-6. CPG CIRCUIT BRAKER PANEL NO. 2 EDGE-LIGHT - DOES NOT LIGHT

Tools: (para 9-29-5)

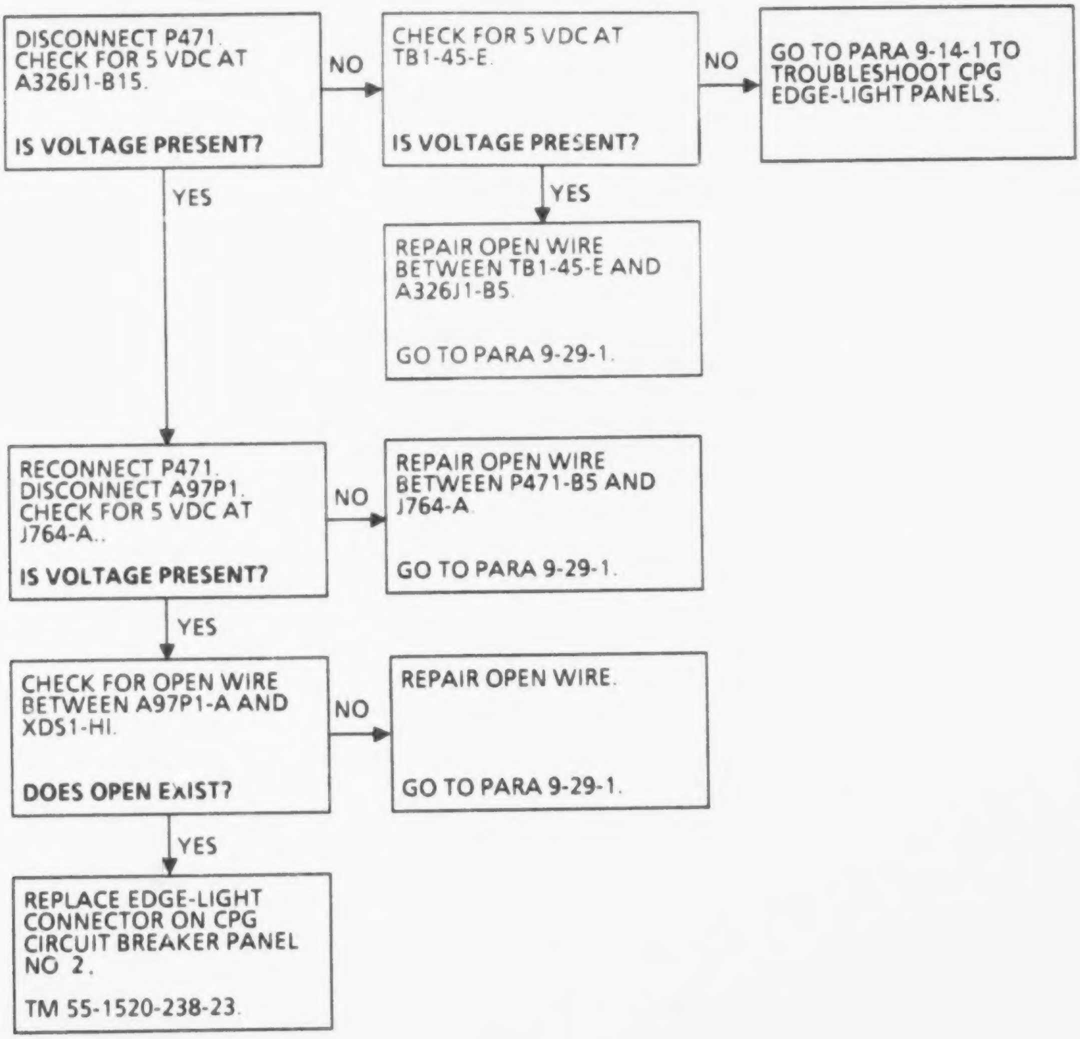
Personnel Required: (para 9-29-5)

References: (para 9-29-5)

Equipment Conditions: (para 9-29-5)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



DISCONNECT P471. CHECK FOR 5 VDC AT A326J1-B15.

IS VOLTAGE PRESENT?

CHECK FOR 5 VDC AT TB1-45-E.

IS VOLTAGE PRESENT?

GO TO PARA 9-14-1 TO TROUBLESHOOT CPG EDGE-LIGHT PANELS.

REPAIR OPEN WIRE BETWEEN TB1-45-E AND A326J1-B5.

GO TO PARA 9-29-1.

RECONNECT P471. DISCONNECT A97P1. CHECK FOR 5 VDC AT J764-A..

IS VOLTAGE PRESENT?

REPAIR OPEN WIRE BETWEEN P471-B5 AND J764-A.

GO TO PARA 9-29-1.

CHECK FOR OPEN WIRE BETWEEN A97P1-A AND XDS1-HI.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-29-1.

REPLACE EDGE-LIGHT CONNECTOR ON CPG CIRCUIT BREAKER PANEL NO 2.

TM 55-1520-238-23.

END OF TASK

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

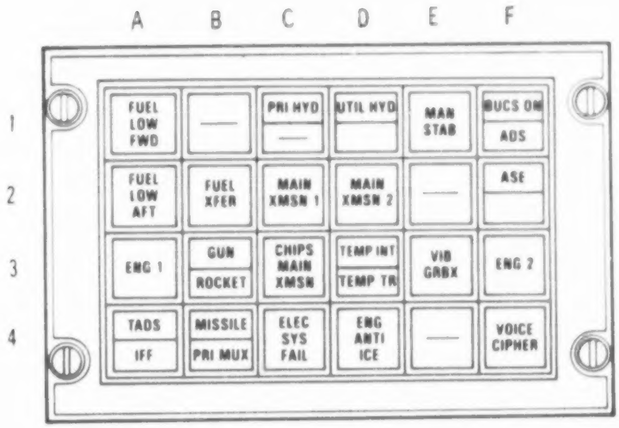
68F10 Aircraft Electrician
One person to assist

References:

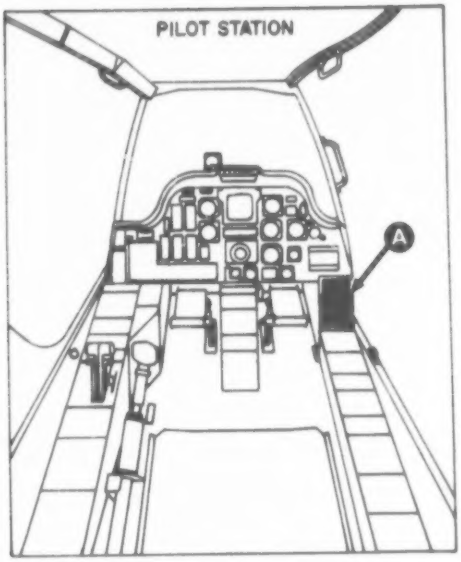
TM 55-1520-238-23

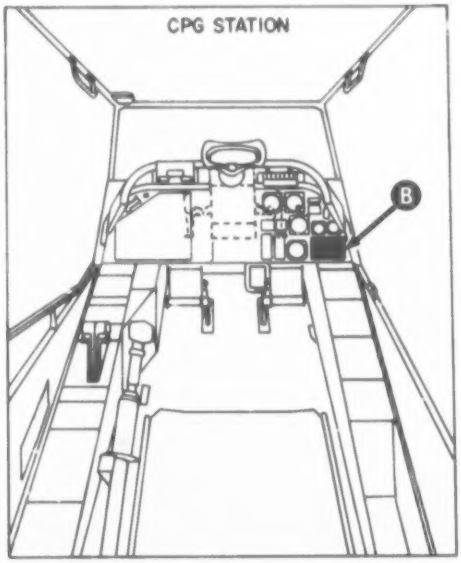
Equipment Conditions:

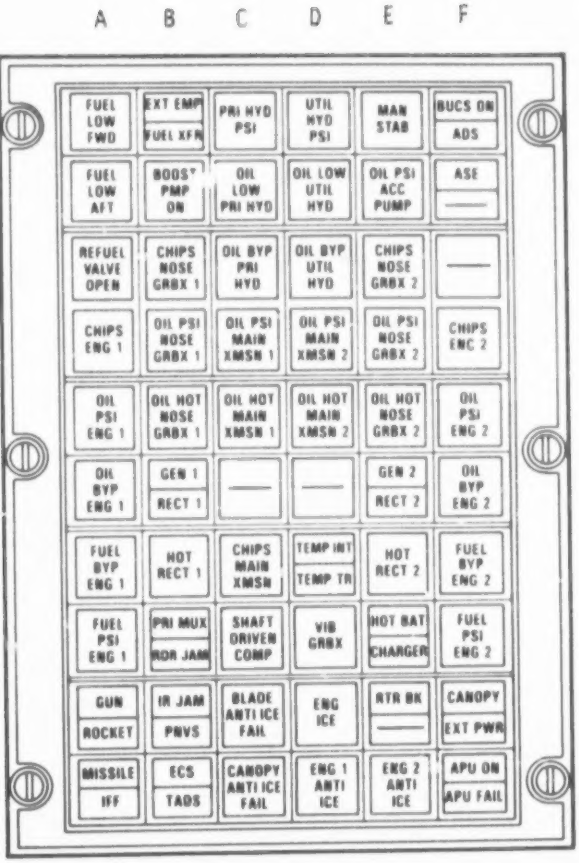
Ref	Condition
TM 55-1520-238-23	Helicopter safed



B CPG CAUTION/WARNING PANEL







A	B	C	D	E	F
FUEL LOW FWD	EXT EMP FUEL XFR	PRI HYD PSI	UTIL HYD PSI	MAN STAB	BUCS ON ADS
FUEL LOW AFT	BOOST PMP ON	OIL LOW PRI HYD	OIL LOW UTIL HYD	OIL PSI ACC PUMP	ASE ——
REFUEL VALVE OPEN	CHIPS NOSE GRBX 1	OIL BYP PRI HYD	OIL BYP UTIL HYD	CHIPS NOSE GRBX 2	——
CHIPS ENG 1	OIL PSI NOSE GRBX 1	OIL PSI MAIN XMSN 1	OIL PSI MAIN XMSN 2	OIL PSI NOSE GRBX 2	CHIPS ENG 2
OIL PSI ENG 1	OIL HOT NOSE GRBX 1	OIL HOT MAIN XMSN 1	OIL HOT MAIN XMSN 2	OIL HOT NOSE GRBX 2	OIL PSI ENG 2
OIL BYP ENG 1	GEN 1 RECT 1	——	——	GEN 2 RECT 2	OIL BYP ENG 2
FUEL BYP ENG 1	HOT RECT 1	CHIPS MAIN XMSN	TEMP INT TEMP TR	HOT RECT 2	FUEL BYP ENG 2
FUEL PSI ENG 1	PRI MUX ROR JAM	SHAFT DRIVEN COMP	VIB GRBX	HOT BAT CHARGER	FUEL PSI ENG 2
GUN ROCKET	IR JAM PNVS	BLADE ANTI ICE FAIL	ENG ICE	RTR BK ——	CANOPY EXT PWR
MISSILE IFF	ECS TADS	CANOPY ANTI ICE FAIL	ENG 1 ANTI ICE	ENG 2 ANTI ICE	APU ON APU FAIL

Ⓐ PILOT CAUTION/WARNING PANEL

MM04/1-1032A

GO TO NEXT PAGF

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA (cont)

A. Use the caution/warning functional data as follows:

TASK	RESULT
1. On pilot caution/warning panel, remove P18. Apply input signal to pilot panel input pin numbers. EXAMPLE: For ASE indicator (pilot lamp key F2), supply ground at pin J1-46. Check that ASE indicator is lighted.	If indicator does not light, replace lamp(s) (TM 55-1520-238-23). Apply input signal to pin. Check that indicator is lighted. If replaced lamp(s) do not light, replace pilot caution/warning panel (TM 55-1520-238-23).
2. On CPG caution/warning panel, apply input signals through P18 pins to indicators that receive input signals from pilot caution/warning panel. EXAMPLE: For IFF indicator (CPG lamp key A4), apply 28 VDC at pin P18-117. Check that IFF indicator is lighted.	If indicator does not light, disconnect P19 from CPG caution/warning panel. Apply input signal to CPG panel input pin. EXAMPLE: For CPG IFF indicator, apply 28 VDC at J1-1. Check that IFF indicator is lighted. If indicator is lighted, check for short or open in wire between pilot panel output pin (P18) and CPG panel input pin (P19). EXAMPLE: For CPG IFF indicator check for open between P18-117 and P19-1, check for short between ground and P18-117. Repair wire. If indicator does not light with input signal applied directly to CPG panel, replace lamp(s). Apply input signal to pin, check that indicator is lighted. If replaced lamp(s) do not light, replace CPG caution/warning panel (TM 55-1520-238-23).

PILOT LAMP KEY	PILOT INDICATOR LEGEND	PILOT PANEL INPUT PIN NO. (P18)	FAULT INPUT SIGNAL (LAMP ON)	PILOT PANEL OUTPUT PIN NO. (P18)	CPG PANEL INPUT PIN NO. (P19)	CPG INDICATOR LEGEND	CPG LAMP KEY
A1	FUEL LOW FWD	J1-21	GROUND	J1-128	J1-21	FUEL LOW FWD	A1
B1	EXT EMP	J1-51	GROUND				
	FUEL XFR	J1-95	GROUND	J1-94	J1-95	FUEL XFER	B2
C1	PRI HYD PSI	J1-71	GROUND	J1-121	J1-71	PRI HYD	C1
D1	UTIL HYD PSI	J1-72	GROUND	J1-122	J1-72	UTIL HYD	D1
E1	MAN STAB	J1-97	GROUND	J1-90	J1-93	MAN STAB	E1
F1	BUCS ON	J1-40	GROUND	J1-114	J1-40	BUCS ON	F1
	ADS	J1-98	+28 VDC	J1-100	J1-98	ADS	
A2	FUEL LOW AFT	J1-22	GROUND	J1-119	J1-22	FUEL LOW AFT	A2
B2	BOOST PUMP ON	J1-96	+28 VDC				
C2	OIL LOW PRI HYD	J1-68	GROUND				
D2	OIL LOW UTIL HYD	J1-67	GROUND				
E2	OIL PSI ACC PUMP	J1-4	GROUND				
F2	ASE	J1-46	GROUND	J1-116	J1-46	ASE	F2
A3	REFUEL VALVE OPEN	J1-76	GROUND				

GO TO NEXT PAGE

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA (cont)

PILOT LAMP KEY	PILOT INDICATOR LEGEND	PILOT PANEL INPUT PIN NO. (P18)	FAULT INPUT SIGNAL (LAMP ON)	PILOT PANEL OUTPUT PIN NO. (P18)	CPG PANEL INPUT PIN NO. (P19)	CPG INDICATOR LEGEND	CPG LAMP KEY
B3	CHIPS NOSE GRBX 1	J1-36	GROUND	J1-103	J1-36	ENG 1	A3
C3	OIL BYP PRI HYD	J1-69	GROUND				
D3	OIL BYP UTIL HYD	J1-70	GROUND				
E3	OIL PSI ACC PUMP	J1-4	GROUND				
A4	CHIPS ENG 1	J1-29	GROUND	J1-58	J1-29	ENG 1	A3
B4	OIL PSI NOSE GRBX 1	J1-44	GROUND	J1-105	J1-44	ENG 1	A3
C4	OIL PSI MAIN XMSN 1	J1-9	GROUND	J1-83	J1-9	MAIN XMSN 1	C2
D4	OIL PSI MAIN XMSN 2	J1-10	GROUND	J1-84	J1-10	MAIN XMSN 2	D2
E4	OIL PSI NOSE GRBX2	J1-45	GROUND	J1-106	J1-45	ENG 2	F3
F4	CHIPS ENG 2	J1-30	GROUND	J1-59	J1-30	ENG 2	F3
A5	OIL PSI ENG 1	J1-7	GROUND	J1-81	J1-7	ENG 1	A3
B5	OIL HOT NOSE GRBX 1	J1-52	GROUND	J1-107	J1-52	ENG 1	A3
C5	OIL HOT MAIN XMSN 1	J1-65	GROUND	J1-109	J1-65	MAIN XMSN 1	C2
D5	OIL HOT MAIN XMSN 2	J1-66	GROUND	J1-110	J1-66	MAIN XMSN 2	D2
E5	OIL HOT NOSE GRBX 2	J1-53	GROUND	J1-108	J1-53	ENG 2	F3
F5	OIL PSI ENG 2	J1-8	GROUND	J1-82	J1-8	ENG 2	F3
A6	OIL BYP ENG 1	J1-17	GROUND	J1-87	J1-17	ENG 1	A3
B6	GEN 1	J1-11	GROUND				
	RECT 1	J1-15	GROUND	J1-20	J1-15	ELEC SYS	C4
E6	GEN 2	J1-12	GROUND				
	RECT 2	J1-16	GROUND	J1-13	J1-16	ELEC SYS FAIL	C4
F6	OIL BYP ENG 2	J1-18	GROUND	J1-88	J1-18	ENG 2	F3
A7	FUEL BYP ENG 1	J1-23	GROUND	J1-91	J1-23	ENG 1	A3
B7	HOT RECT 1	J1-42	GROUND				
C7	CHIPS MAIN XMSN	J1-3	GROUND	J1-80	J1-3	CHIPS MAIN XMSN	C3
D7	TEMP INT	J1-26	GROUND	J1-33	J1-26	TEMP INT	
	TEMP TR	J1-25	GROUND	J1-64	J1-25	TEMP TR	
E7	HOT RECT 2	J1-43	GROUND				
F7	FUEL BYP ENG 2	J1-24	GROUND	J1-92	J1-24	ENG 2	F3
A8	FUEL PSI ENG 1	J1-78	GROUND	J1-5	J1-78	ENG 1	A3

GO TO NEXT PAG

best copy available

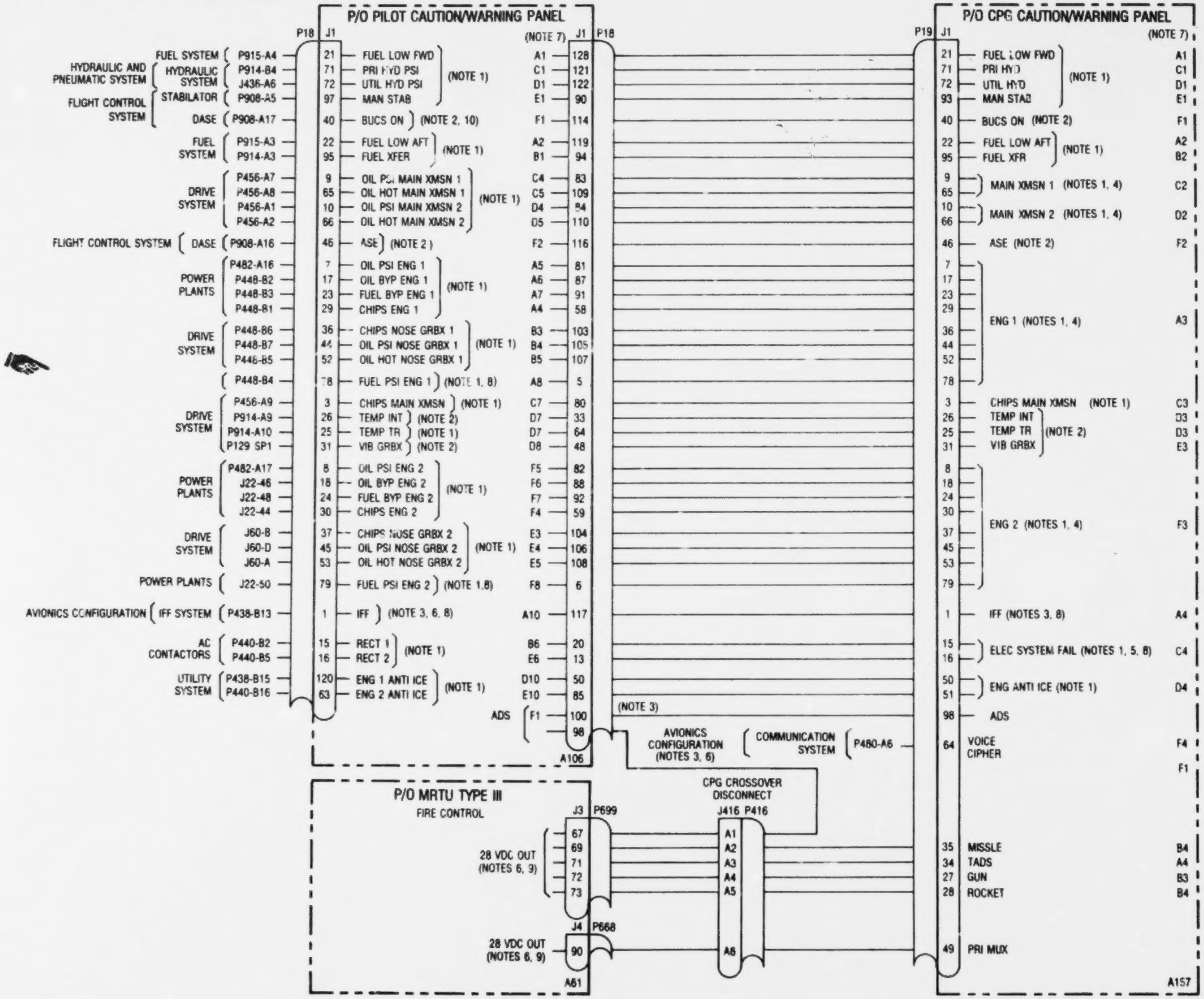
Reproduced from poor document.

9-30-1. PILOT AND CPG CAUTION/WARNING PANELS - INDICATORS FUNCTIONAL DATA (cont)

PILOT LAMP KEY	PILOT INDICATOR LEGEND	PILOT PANEL INPUT PIN NO. (P18)	FAULT INPUT SIGNAL (LAMP ON)	PILOT PANEL OUTPUT PIN NO. (P18)	CPG PANEL INPUT PIN NO. (P19)	CPG INDICATOR LEGEND	CPG LAMP KEY
B8	PRI MUX	J1-49	+28 VDC				
	RDR JAM	J1-101	GROUND				
C8	SHAFT DRIVEN COMP	J1-38	GROUND				
D8	VIB GRBX	J1-31	GROUND	J1-48	J1-31	VIB GRBX	E3
E8	HOT BAT	J1-57	GROUND				
	CHARGER	J1-56	GROUND				
F8	FUEL PSI ENG 2	J1-79	GROUND	J1-6	J1-79	ENG 2	F3
A9	GUN	J1-27	+28 VDC				
	ROCKET	J1-28	+28 VDC				
B9	IR JAM	J1-99	GROUND				
	PNVS	J1-77	+28 VDC				
C9	BLADE ANTI ICE FAIL	J1-75	GROUND				
D9	ENG ICE	J1-73	+28 VDC				
E9	RTR BK	J1-2	+28 VDC				
F9	CANOPY	J1-32	GROUND				
F9	EXT PWR	J1-47	GROUND				
A10	MISSILE	J1-35	+28 VDC				
	IFF	J-1	+28 VDC	J1-117	J1-1	IFF	A4
B10	ECS	J1-39	+28 VDC				
	TADS	J1-34	+28 VDC				
C10	CANOPY ANTI ICE FAIL	J1-74	GROUND				
D10	ENG 1 ANTI ICE	J1-120	GROUND	J1-50	J1-50	ENG ANTI ICE	D4
E10	ENG 2 ANTI ICE	J1-63	GROUND	J1-85	J1-51	ENG ANTI ICE	D4
F10	APU ON	J1-54	+28 VDC				
	APU FAIL	J1-55	GROUND				
			+28 VDC		J1-27	GUN	B3
			+28 VDC		J1-28	ROCKET	
			+28 VDC		J1-35	MISSILE	B4
			+28 VDC		J1-49	PRI MUX	
			+28 VDC		J1-64	VOICE CIPHER	F4

END OF TASK

9-30-2. PILOT AND CPG CAUTION/WARNING PANELS - INTERCONNECTION DIAGRAM



NOTES:

1. MECHANICAL SWITCH CLOSURE FAULT INPUT SIGNAL:

   LIGHT OFF - 5 - 30 VDC
   LIGHT ON - 0.1 VDC (GROUND)

2. SOLID STATE SWITCH CLOSURE INPUT SIGNAL:

   LIGHT OFF - 5 - 30 VDC
   LIGHT ON - 0.5 VDC (GROUND)

3. 28 VDC INPUT SIGNAL:

   LIGHT OFF - 0 - 0.5 VDC (GROUND)
   LIGHT ON - 16 - 30 VDC

4. ONE OR MORE FAULT INPUTS TURNS ON LIGHT.

5. BOTH FAULT INPUTS MUST BE PRESENT TO TURN ON LIGHT.

6. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.

7. ITEMS IN THIS COLUMN INDICATE LIGHT POSITIONS SHOWN IN PILOT AND CPG CAUTION/WARNING PANEL FUNCTIONAL DATA.

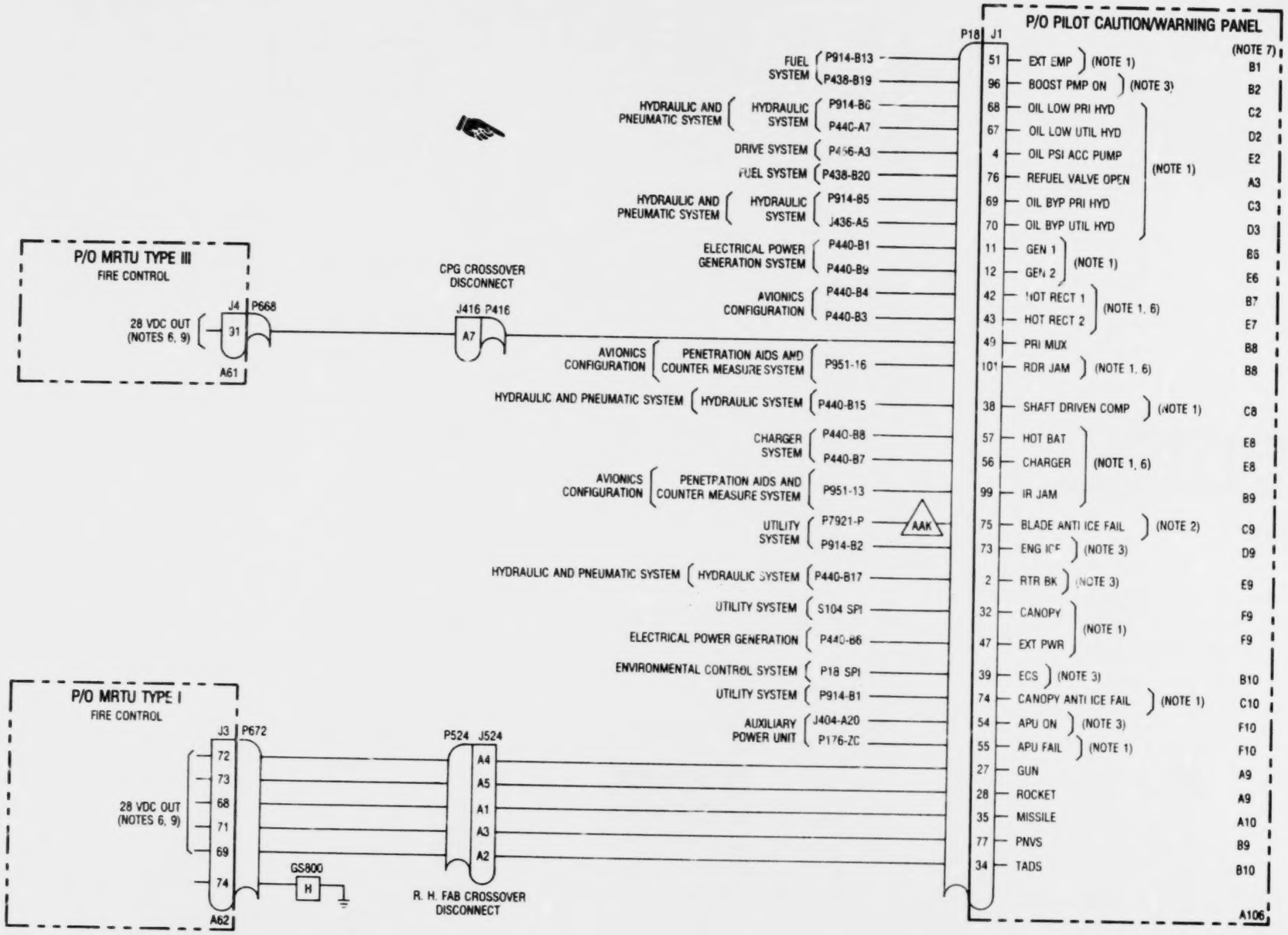
8. ALL LIGHTS ARE RED WARNING LIGHTS.

9. AT FAILURE.

10. BUCS INDICATOR WILL NOT LIGHT IN AIRCRAFT WITH BUCS DEACTIVATED.

SHEET 1 OF 2 MM04/1-784-1H

9-30-2. PILOT AND CPG CAUTION/WARNING PANELS - INTERCONNECTION DIAGRAM (cont)



SHEET 2 OF 2 MM04/1-784-28

9-31-1. PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK

Personnel Required:

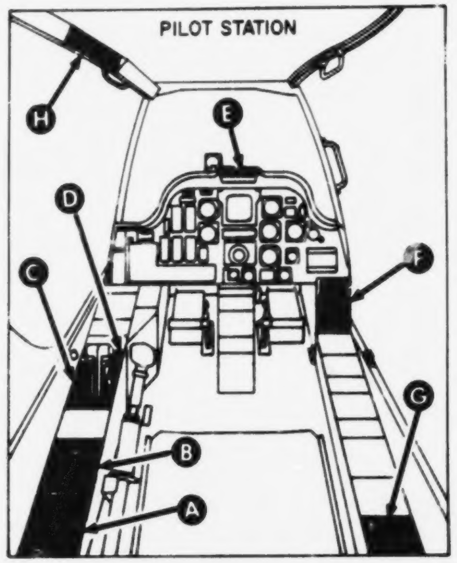
68F10 Aircraft Electrician

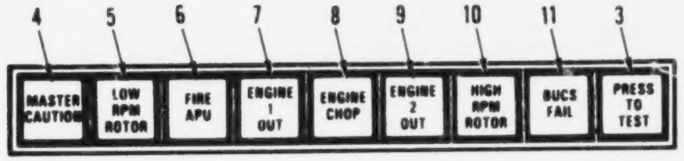
References:

TM 55-1520-238-23

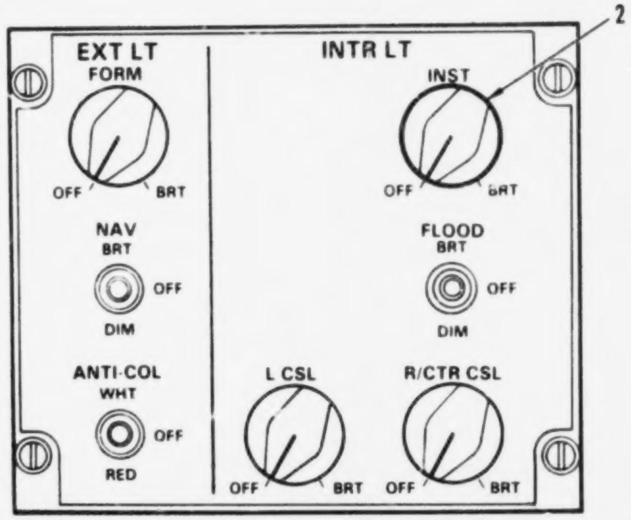
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External Power Application - Electrical

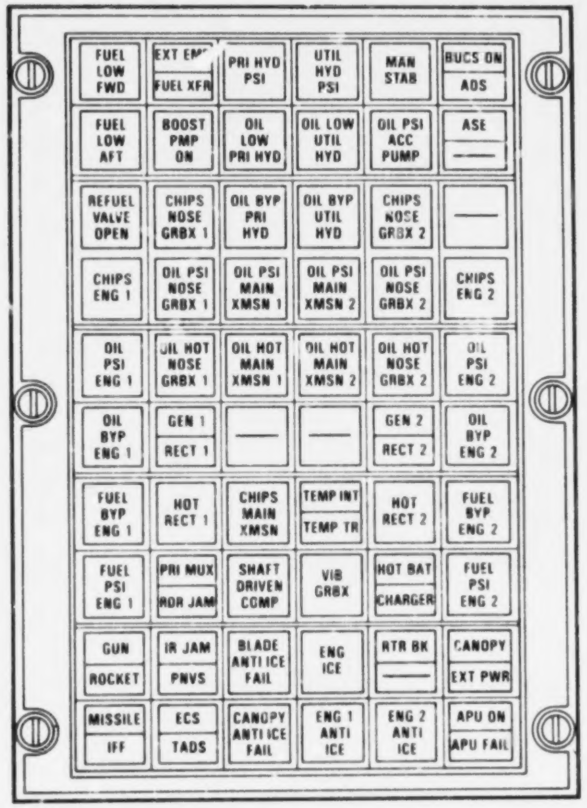




E PILOT MASTER CAUTION/WARNING PANEL

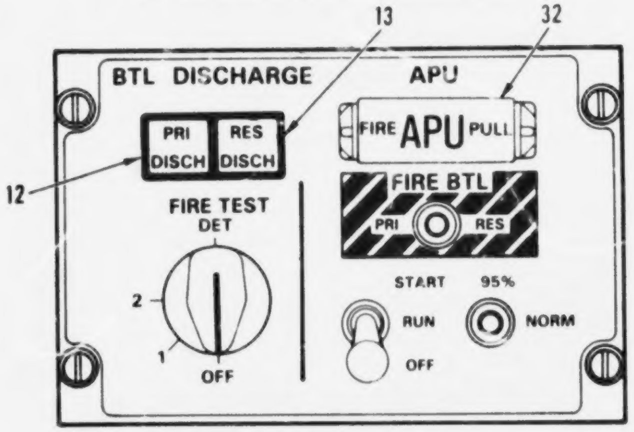


B PILOT EXT LT/INTR LT PANEL

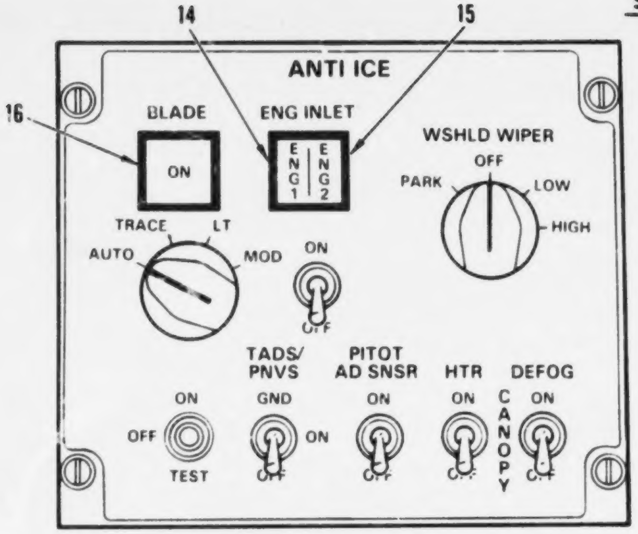


FUEL LOW FWD	EXT EM FUEL XFR	PRI HYD PSI	UTIL HYD PSI	MAN STAB	BUCS ON ADS
FUEL LOW AFT	BOOST PMP ON	OIL LOW PRI HYD	OIL LOW UTIL HYD	OIL PSI ACC PUMP	ASE —
REFUEL VALVE OPEN	CHIPS NOSE GRBX 1	OIL BYP PRI HYD	OIL BYP UTIL HYD	CHIPS NOSE GRBX 2	—
CHIPS ENG 1	OIL PSI NOSE GRBX 1	OIL PSI MAIN XMSN 1	OIL PSI MAIN XMSN 2	OIL PSI NOSE GRBX 2	CHIPS ENG 2
OIL PSI ENG 1	OIL HOT NOSE GRBX 1	OIL HOT MAIN XMSN 1	OIL HOT MAIN XMSN 2	OIL HOT NOSE GRBX 2	OIL PSI ENG 2
OIL BYP ENG 1	GEN 1 RECT 1	—	—	GEN 2 RECT 2	OIL BYP ENG 2
FUEL BYP ENG 1	HOT RECT 1	CHIPS MAIN XMSN	TEMP INT TEMP TR	HOT RECT 2	FUEL BYP ENG 2
FUEL PSI ENG 1	PRI MUX RDR JAM	SHAFT DRIVEN COMP	VIB GRBX	HOT BAT CHARGER	FUEL PSI ENG 2
GUN ROCKET	IR JAM PNVS	BLADE ANTI ICE FAIL	ENG ICE	RTR BK —	CANOPY EXT PWR
MISSILE IFF	ECS TADS	CANOPY ANTI ICE FAIL	ENG 1 ANTI ICE	ENG 2 ANTI ICE	APU ON APU FAIL

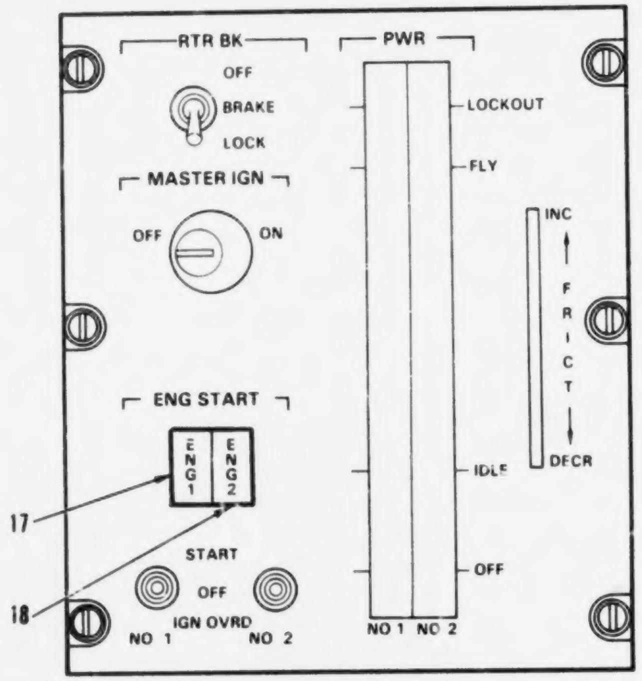
F PILOT CAUTION/WARNING PANEL



G BTL DISCHARGE/APU PANEL



A ANTI-ICE PANEL



C POWER QUADRANT PANEL

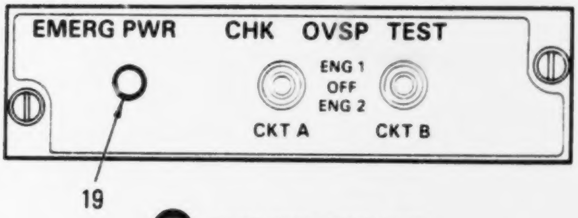
MM04/1-1029-1B

GO TO NEXT PAGE

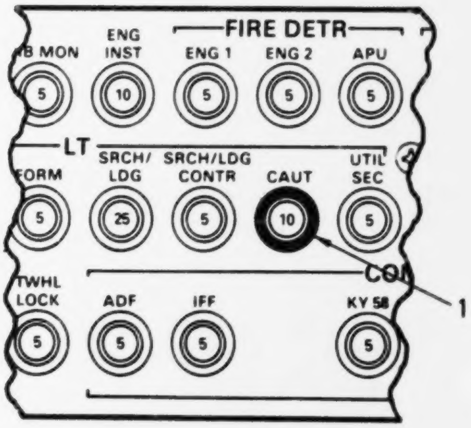
9-31-1. PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that **LT CAUT** circuit breaker (1) is closed.	If circuit breaker (1) does not stay closed, go to para 9-31-4.
2. On pilot **EXT LT/INTR LT** panel, turn **INST** control (2) to **BRT**.	
3. On pilot master caution/warning panel, check that **PRESS TO TEST** indicator (3) is lighted.	If **PRESS TO TEST** indicator is not lighted, go to para 9-31-5.
4. On pilot master caution/warning panel, depress **PRESS TO TEST** indicator (3).	If all master caution/warning indicators, are not lighted, go to para 9-31-6. If **MASTER CAUTION** indicator (4) is not lighted and flashing, go to para 9-31-7. If **LOW RPM ROTOR** indicator (5) is not lighted, go to para 9-31-8. If **FIRE APU** indicator (6) is not lighted, go to para 9-31-9. If **ENGINE 1 OUT** indicator (7) is not lighted, go to para 9-31-10. If **ENGINE CHOP** indicator (8) is not lighted, go to para 9-31-11. If **ENGINE 2 OUT** indicator (9) is not lighted, go to para 9-31-12. If **HIGH RPM ROTOR** indicator (10) is not lighted, go to para 9-31-13. If **BUCS FAIL** indicator (11) is not lighted, go to para 9-31-14.



Ⓓ PILOT OVSP TEST PANEL



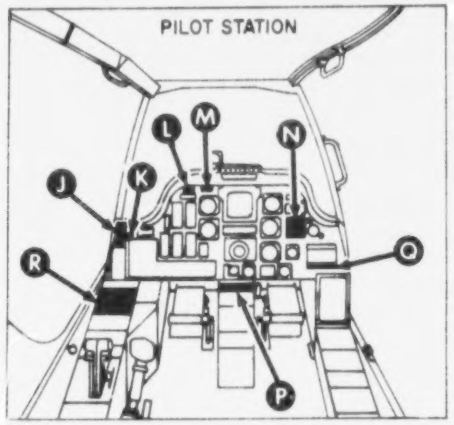
Ⓗ PILOT CENTER CIRCUIT BREAKER PANEL

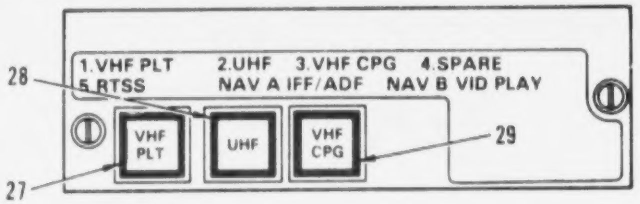
MM04/1-1029-2A

TASK	RESULT
5. On pilot caution/warning panel, check that all indicators are lighted and flashing.	If all caution/warning indicators are not lighted and flashing, go to para 9-31-6.
	If some indicators are not lighted and flashing, go to para 9-31-1.
6. On **BTL DISCHARGE/APU** panel, check that **PRI DISCH** (12), and **RES DISCH** (13) indicators are lighted.	If **PRI DISCH** indicator (12) is not lighted, go to para 9-31-15.
	If **RES DISCH** indicator (13) is not lighted, go to para 9-31-16.
7. On **ANTI ICE** panel, check that **ENG 1** (14), **ENG 2** (15), and **BLADE** (16) indicators are lighted.	If **ENG 1** indicator (14) is not lighted, go to para 9-31-17.
	If **ENG 2** indicator (15) is not lighted, go to para 9-31-18.
	If **BLADE** indicator (16) is not lighted, go to para 9-31-19.
8. On power quadrant panel, check that **ENG 1** (17) and **ENG 2** (18)	If **ENG 1** indicator (17) is not lighted, go to para 9-31-20.
	If **ENG 2** indicator (18) is not lighted, go to para 9-31-21.
9. On **OVSP TEST** panel, check that **EMERG PWR** indicator (19) is lighted.	If **EMERG PWR** indicator (19) is not lighted, go to para 9-31-22.
10. On **BTL DISCHARGE/APU** panel, check that the **APU FIRE PULL** handle (32) is lighted.	If **APU FIRE PULL** handle (32) does not light, go to para 9-31-32.

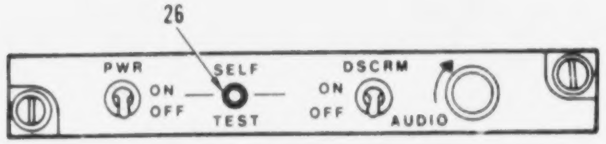
GO TO NEXT PAGE

9-31-1. PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

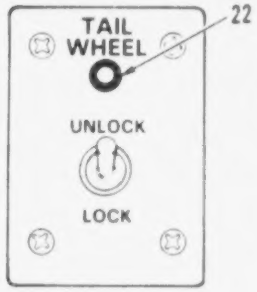



1.VHF PLT 2.UHF 3.VHF CPG 4.SPARE
5.RTSS NAV A IFF/ADF NAV B VID PLAY
28
VHF PLT
UHF
VHF CPG
29
27

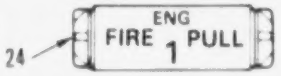
P REMOTE TRANSMITTER SELECTOR PANEL



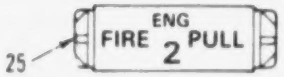
Q RADAR WARNING CONTROL PANEL



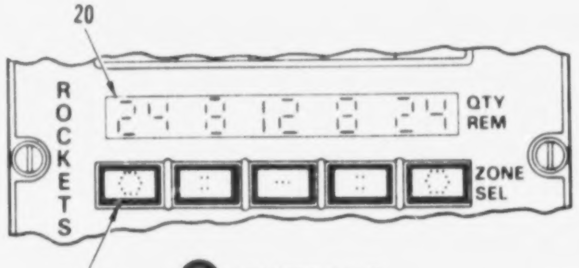
J TAIL WHEEL PANEL



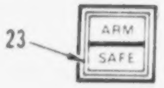
L FIRE PULL ENG 1 INDICATOR



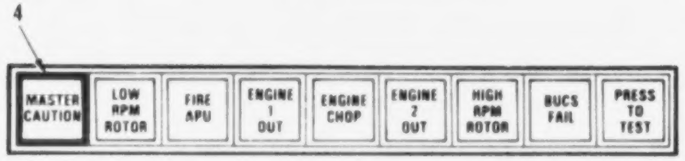
M FIRE PULL ENG 2 INDICATOR



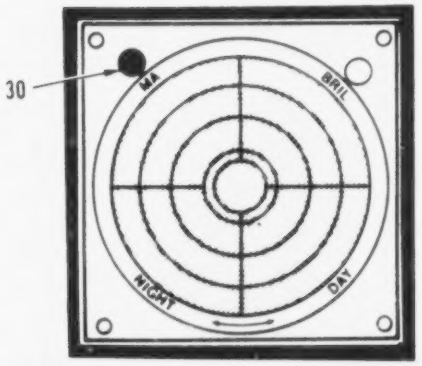
R ROCKETS PANEL



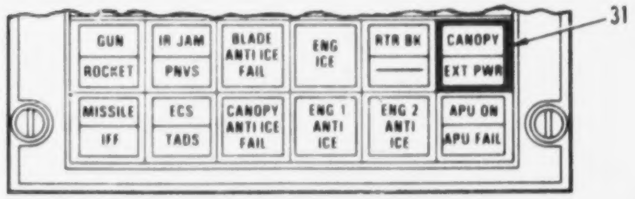
K ARM/SAFE INDICATOR



PILOT MASTER CAUTION/WARNING PANEL



N PILOT RADAR WARNING INDICATOR



PILOT CAUTION/WARNING PANEL

MM04/1-1029-3B

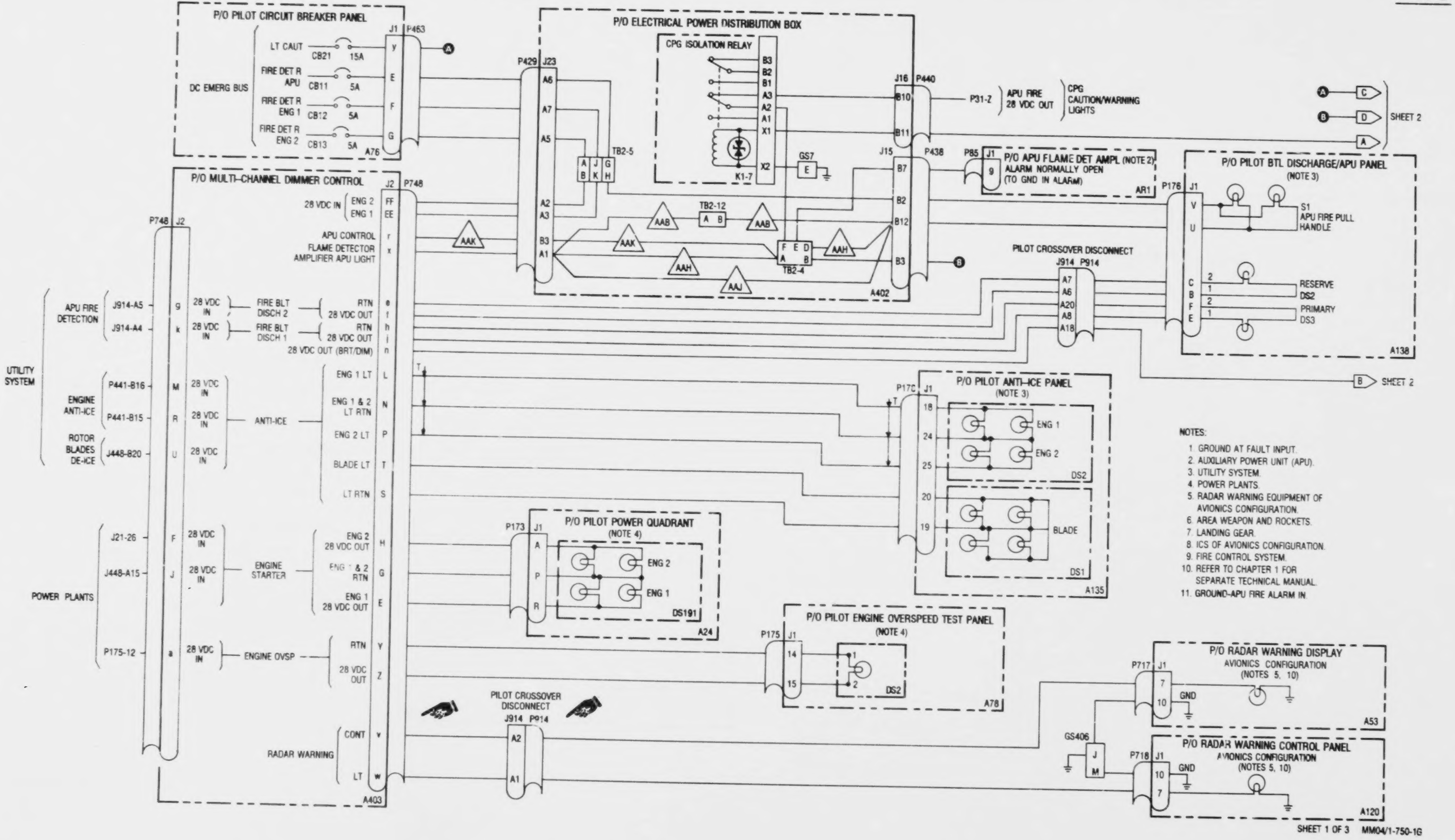
TASK	RESULT
11. On **ROCKETS** panel, check that **QTY REM** (20) and **ZONE SEL** (21) indicators are lighted.	If **QTY REM** (20) and **ZONE SEL** (21) indicators are not lighted, go to para 9-31-23.
12. On **TAILWHEEL** panel, check that **TAILWHEEL UNLOCK** indicator (22) is lighted.	If **TAILWHEEL UNLOCK** indicator (22) is not lighted, go to para 9-31-24.
13. On pilot instrument panel, check that **ARM/SAFE** (23), **FIRE PULL APU 1** (24) and **FIRE PULL APU 2** (25) indicators are lighted.	If **ARM/SAFE** indicator (23) is not lighted, go to para 9-31-25. If **FIRE PULL ENG 1** indicator (24) is not lighted, go to para 9-31-26. If **FIRE PULL ENG 2** indicator (25) is not lighted, go to para 9-31-27.
14. On pilot radar warning indicator, check that **MA** indicator (30) is lighted.	If **MA** indicator (30) is not lighted, go to para 9-31-28.
15. On radar warning control panel, check that **SELF TEST** advisory light (26) is lighted.	If **SELF TEST** advisory light (26) is not lighted, go to para 9-31-29.
16. On remote transmitter selector panel, check that **VHF PLT** (27), **UHF** (28), and **VHF CPG** (29) indicators are lighted.	If **VHF PLT** (27), **UHF** (28), and **VHF CPG** (30) indicator(s) are not lighted, go to para 9-31-30.
17. Open pilot canopy. On pilot master caution/warning panel, check that **MASTER caution** indicator (4) is lighted and flashing.	If **MASTER CAUTION** indicator (4) is not lighted and flashing, go to para 9-31-6.
18. On pilot caution/warning panel, check that **CANOPY** indicator (31) is lighted and flashing.	If **CANOPY** indicator (31) is not lighted and flashing, go to para 9-30-1.
19. On pilot master caution/warning panel, depress **MASTER CAUTION** indicator (4). Check that **MASTER CAUTION** indicator (4) is not lighted.	If **MASTER CAUTION** indicator (4) is lighted, go to para 9-31-31.
20. On pilot caution/warning panel, check that **CANOPY** indicator (31) is lighted and not flashing.	If **CANOPY** indicator (31) is not lighted or is flashing, go to para 9-31-31.

B. On pilot **EXT LT/INTR LT** panel set **INST** switch to **OFF**.

C. Perform EXTERNAL POWER - POWER DOWN procedure (para 9-5-3).

END OF TASK

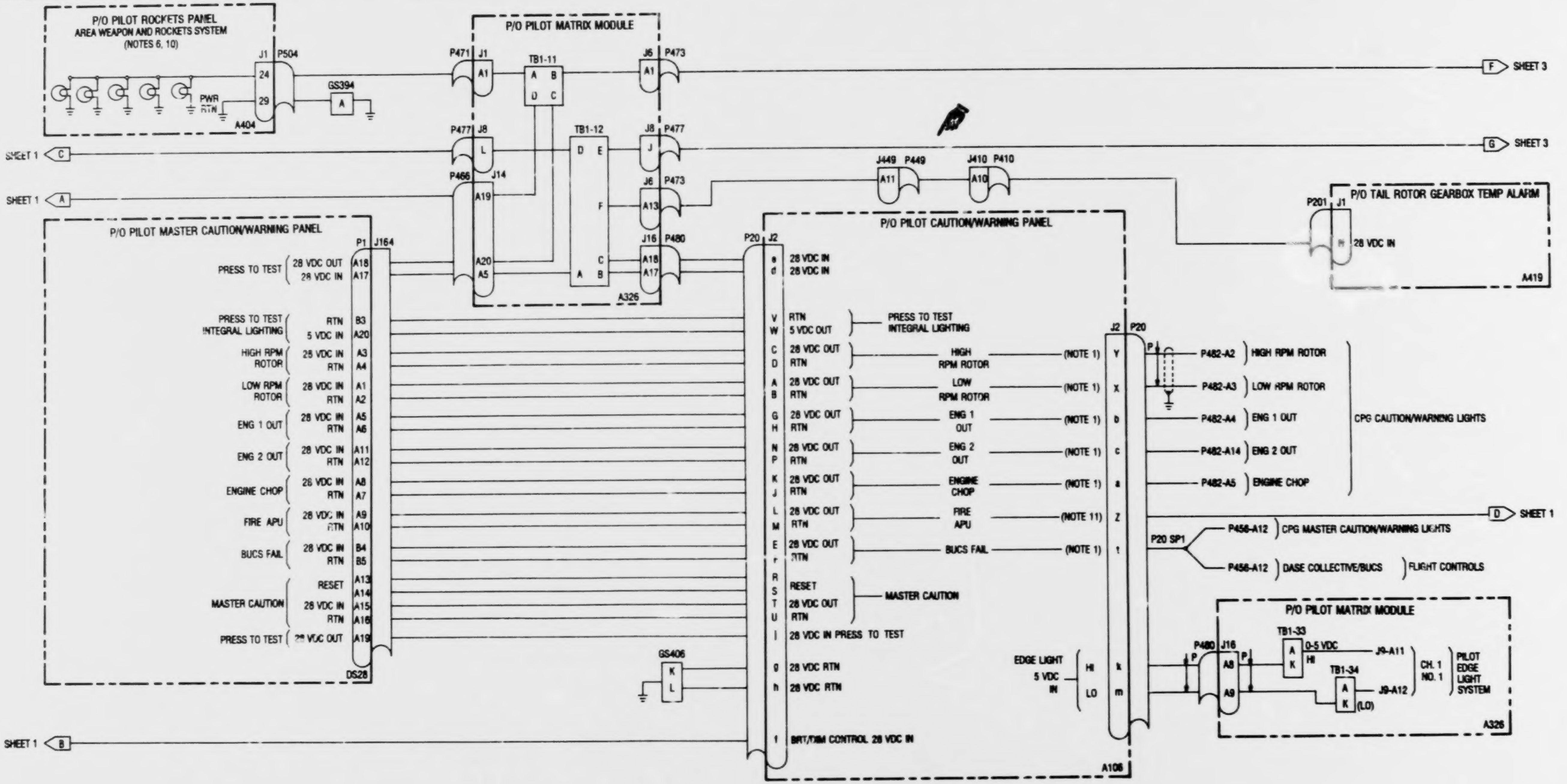
9-31-2. PILOT CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM



NOTES:
1. GROUND AT FAULT INPUT.
2. AUXILIARY POWER UNIT (APU).
3. UTILITY SYSTEM.
4. POWER PLANTS.
5. RADAR WARNING EQUIPMENT OF AVIONICS CONFIGURATION.
6. AREA WEAPON AND ROCKETS.
7. LANDING GEAR.
8. ICS OF AVIONICS CONFIGURATION.
9. FIRE CONTROL SYSTEM.
10. REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL.
11. GROUND-APU FIRE ALARM IN.

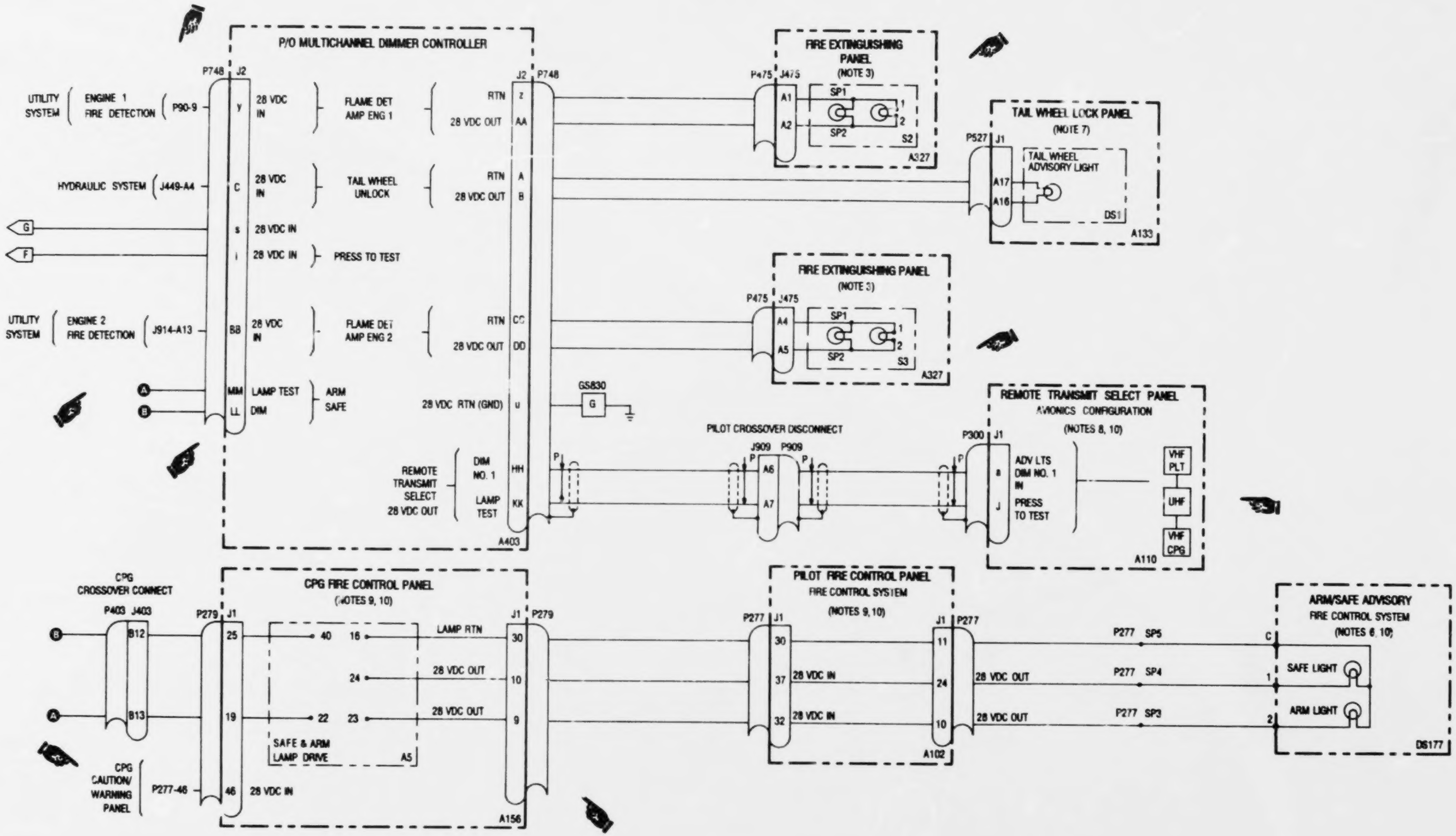
SHEET 1 OF 3 MM04/1-750-1G

9-31-2. PILOT CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)



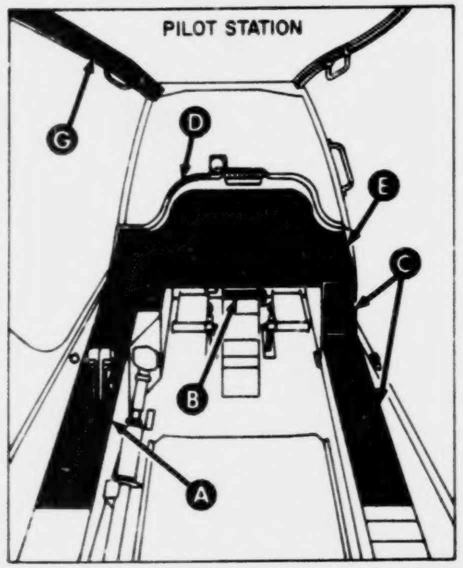
SHEET 2 OF 3 MM04/1-750-2E

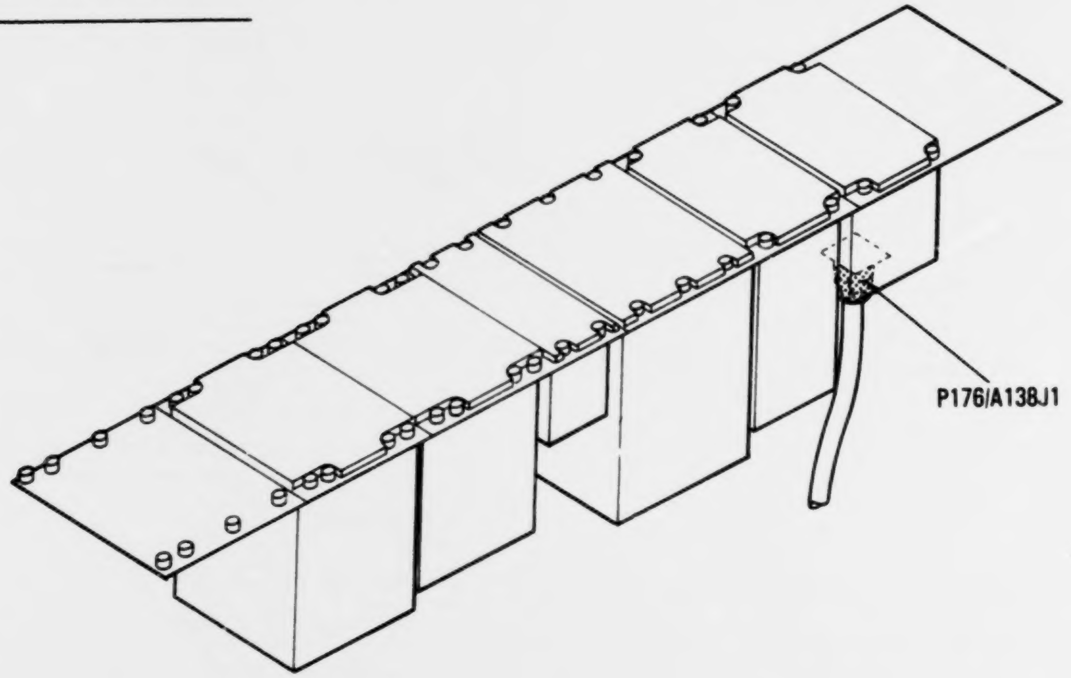
9-31-2. PILOT CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)

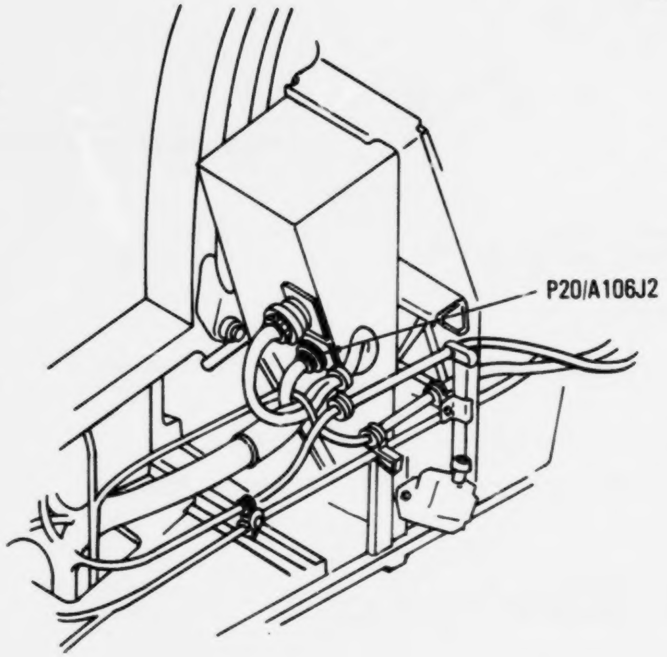


SHEET 3 OF 3 MM04/1-750-3D

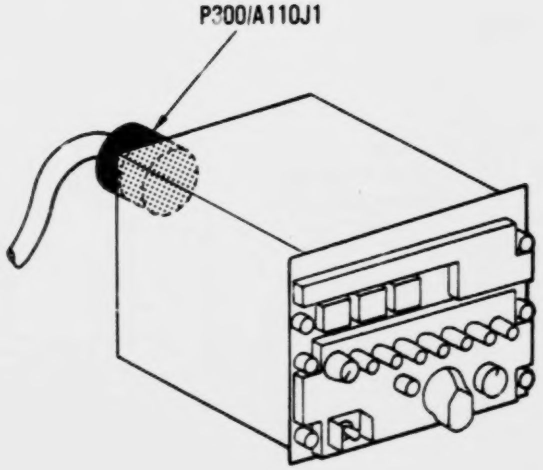
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



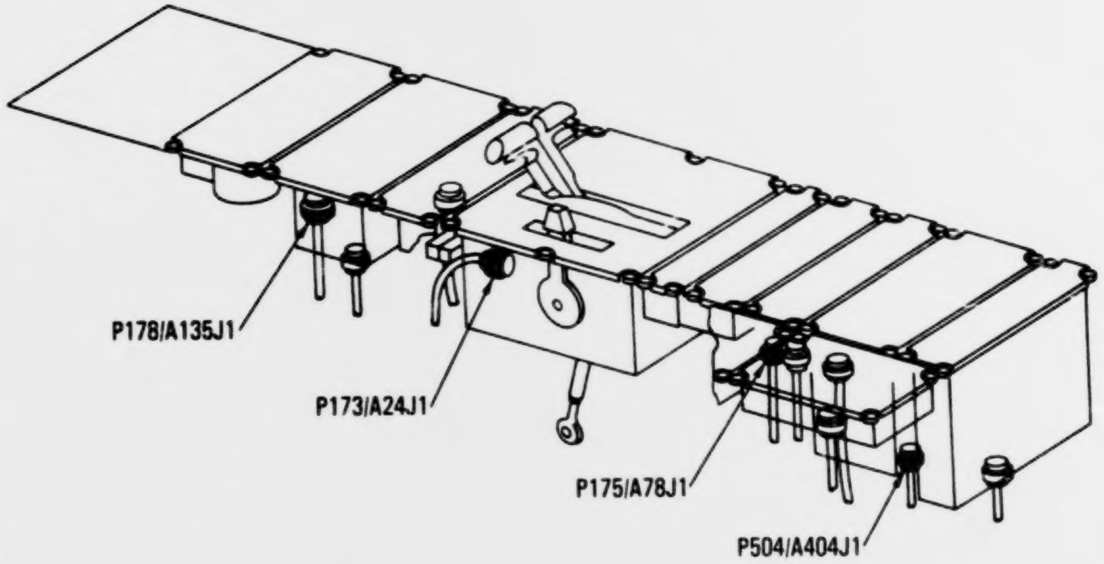




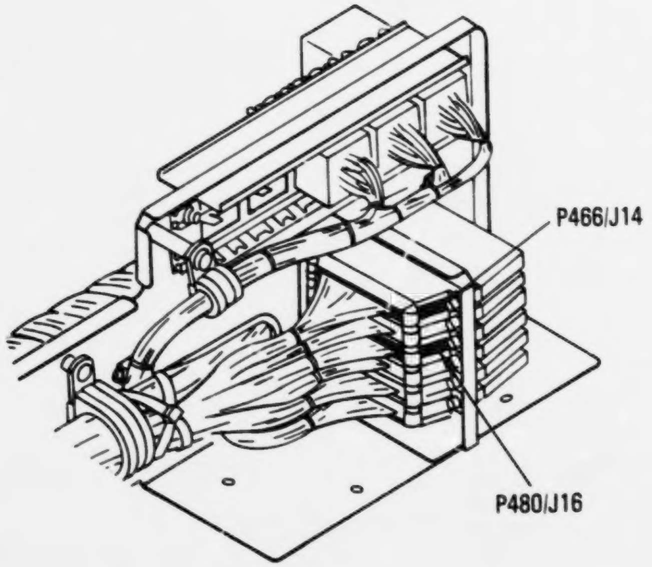
C PILOT RIGHT SIDE CONSOLE



B PILOT CENTER CONSOLE



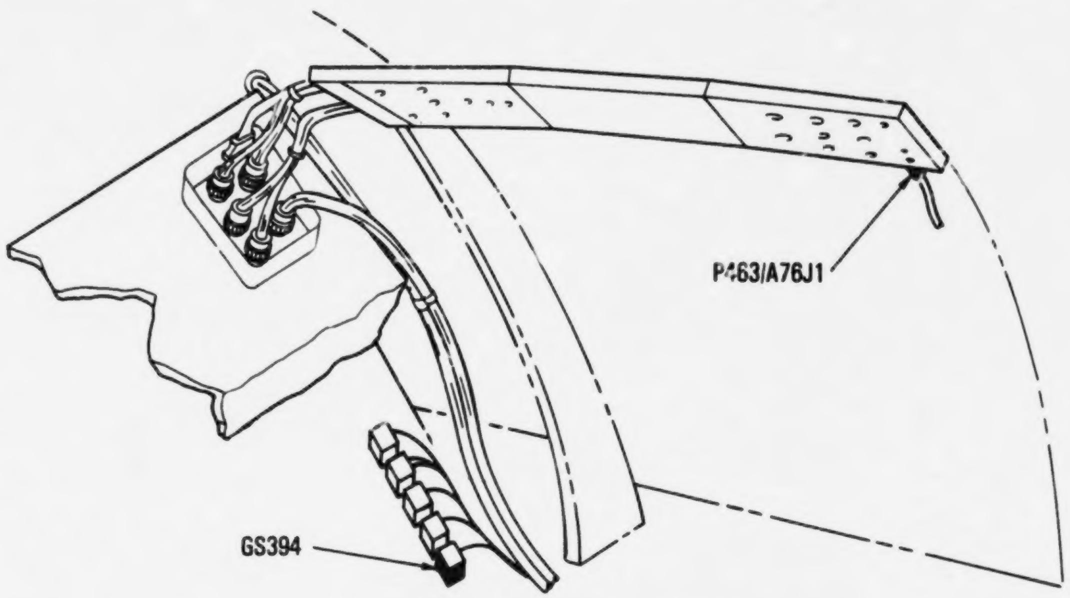
A PILOT LEFT SIDE CONSOLE



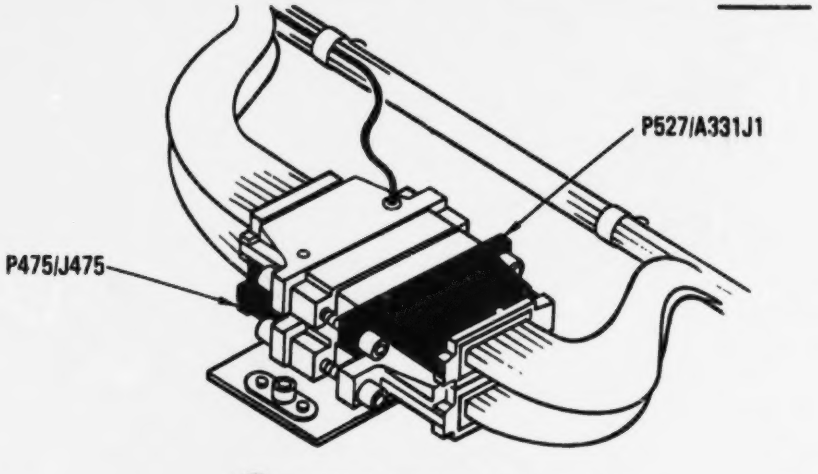
H PILOT MATRIX MODULE (ROTATED)

MM04/1-1102-1B

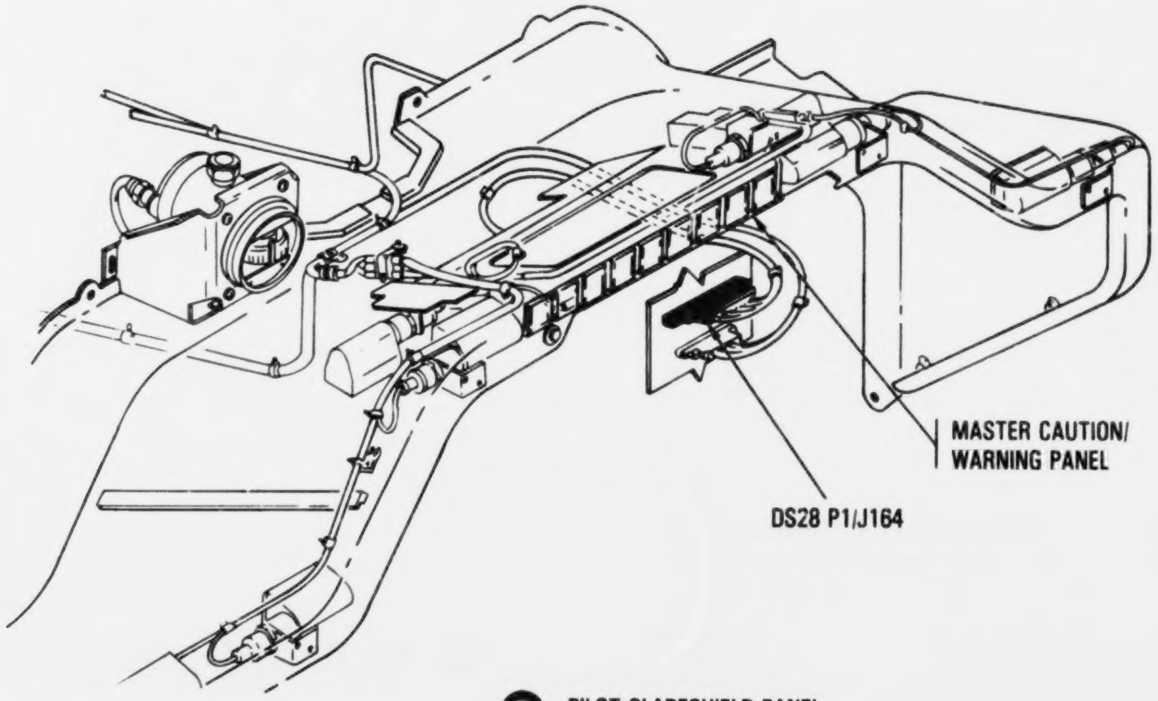
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



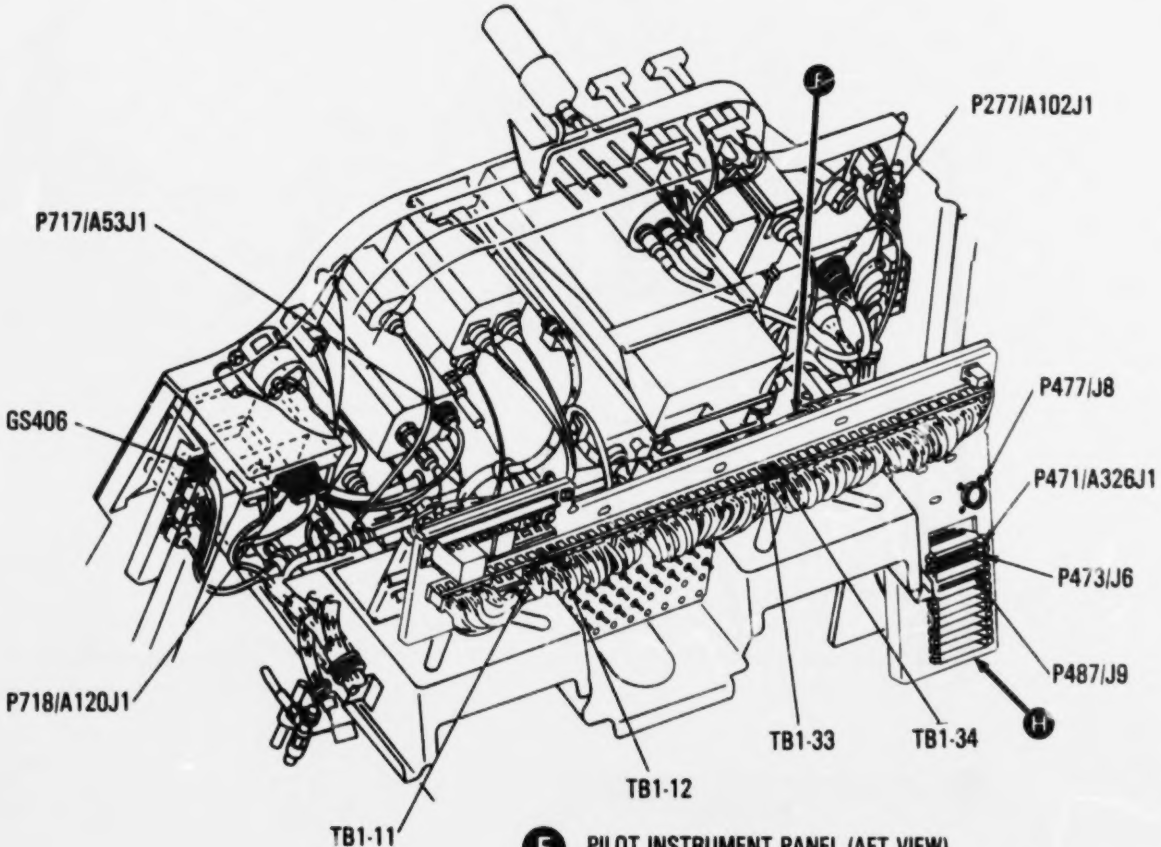
G PILOT CIRCUIT BREAKER PANEL (AFT VIEW)



F INSTRUMENT PANEL WIRING DETAIL



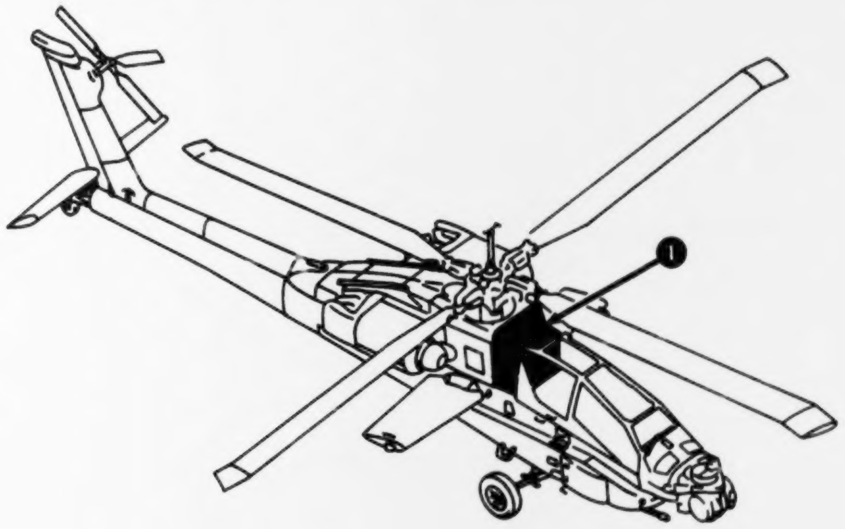
D PILOT GLARESHIELD PANEL

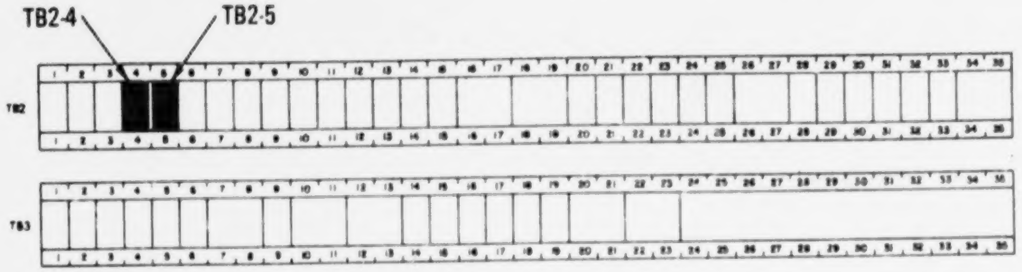


E PILOT INSTRUMENT PANEL (AFT VIEW)

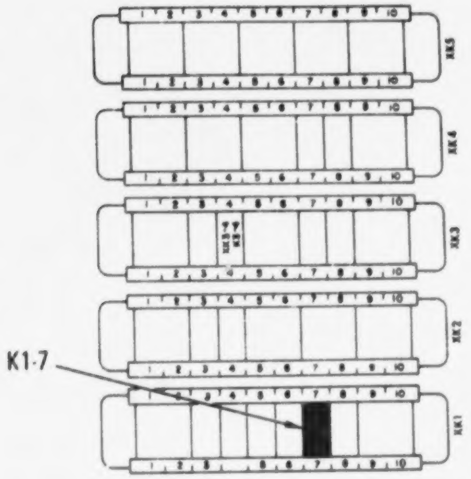
MM04/1102-2B

9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

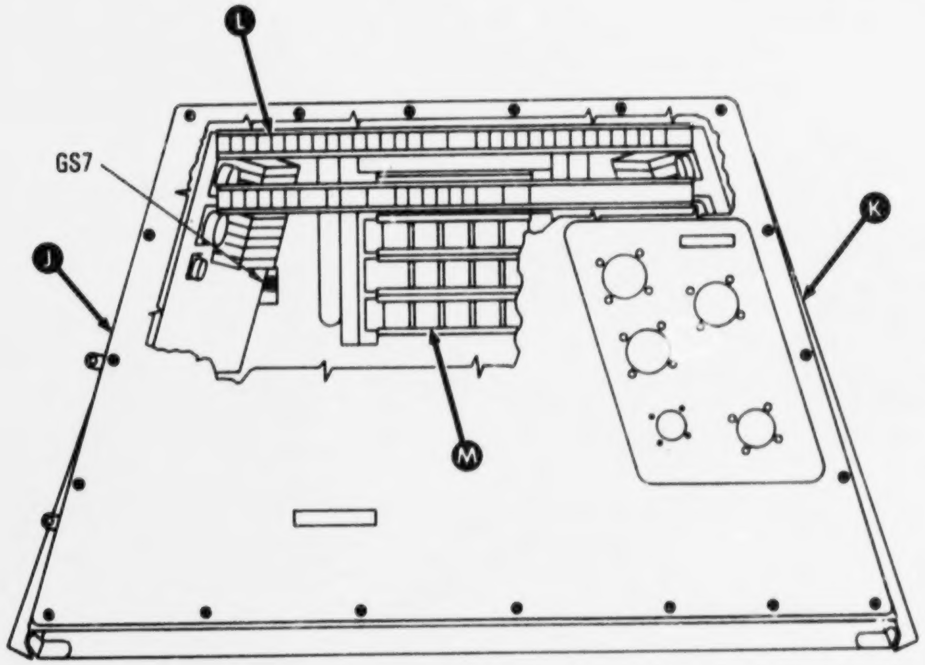


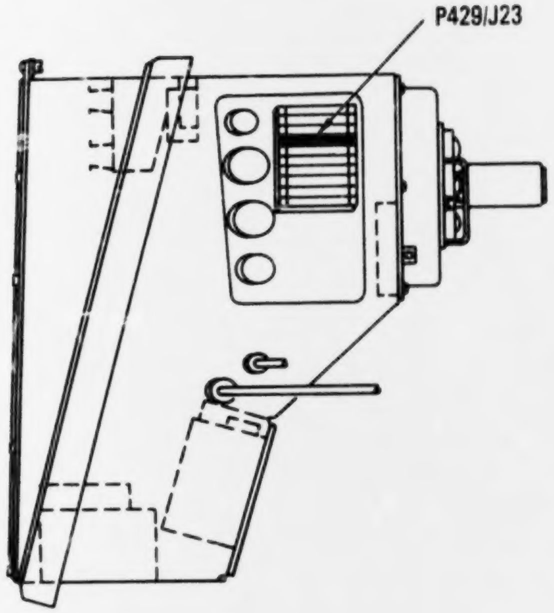


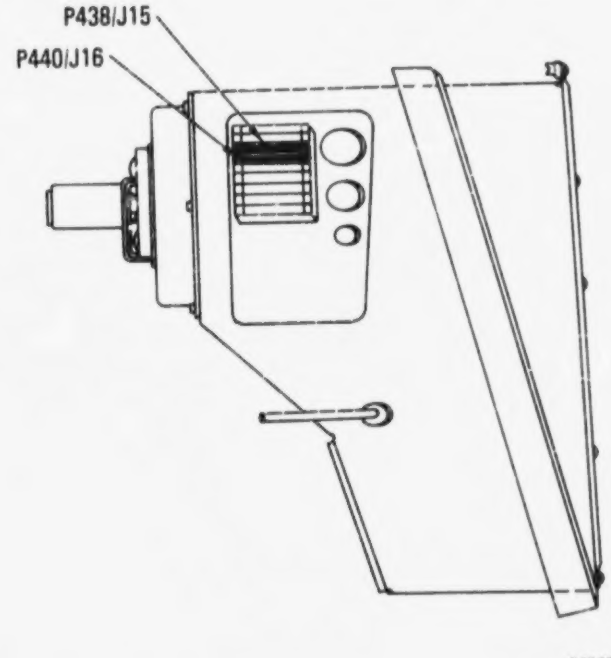
L TERMINAL BOARDS



M RELAYS







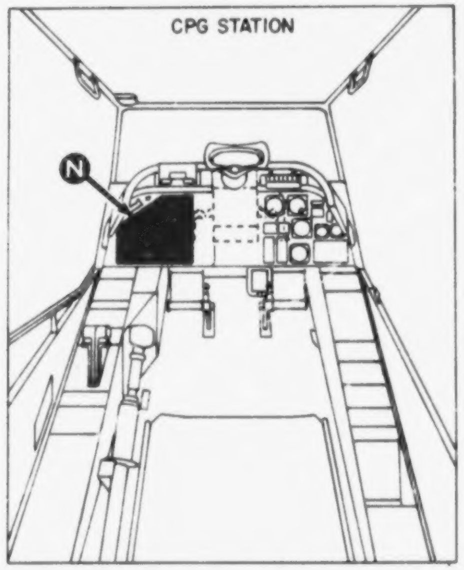
MM04/1-1102-3A

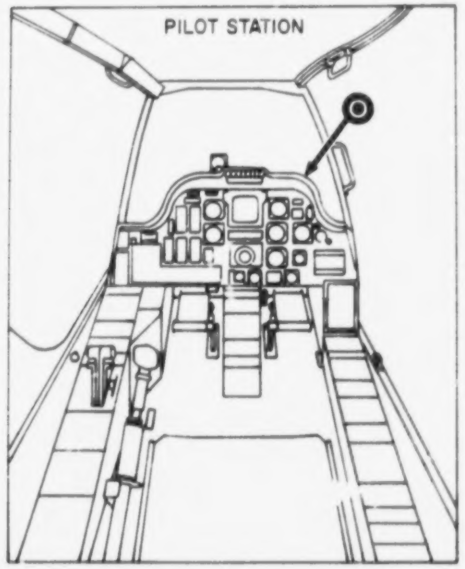
K LEFT SIDE ELECTRICAL POWER CENTER (ROTATED)

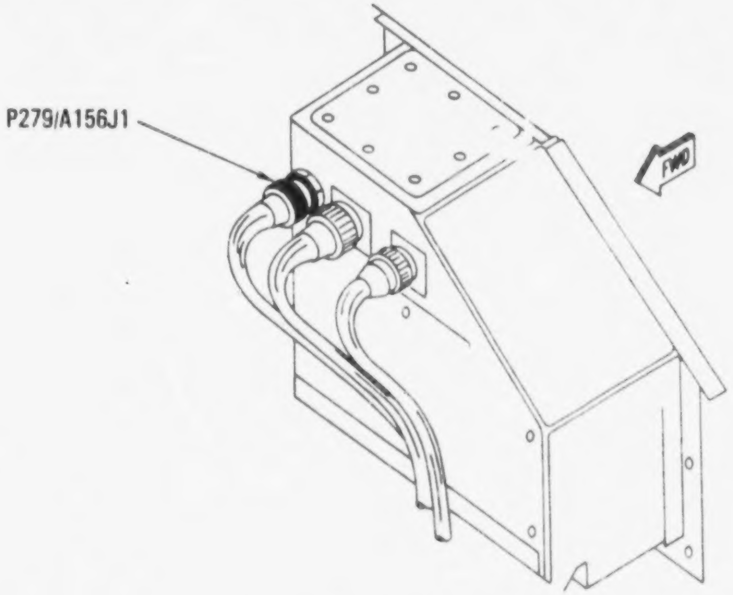
I ELECTRICAL POWER CENTER (AFT VIEW)

J RIGHT SIDE ELECTRICAL POWER CENTER (ROTATED)

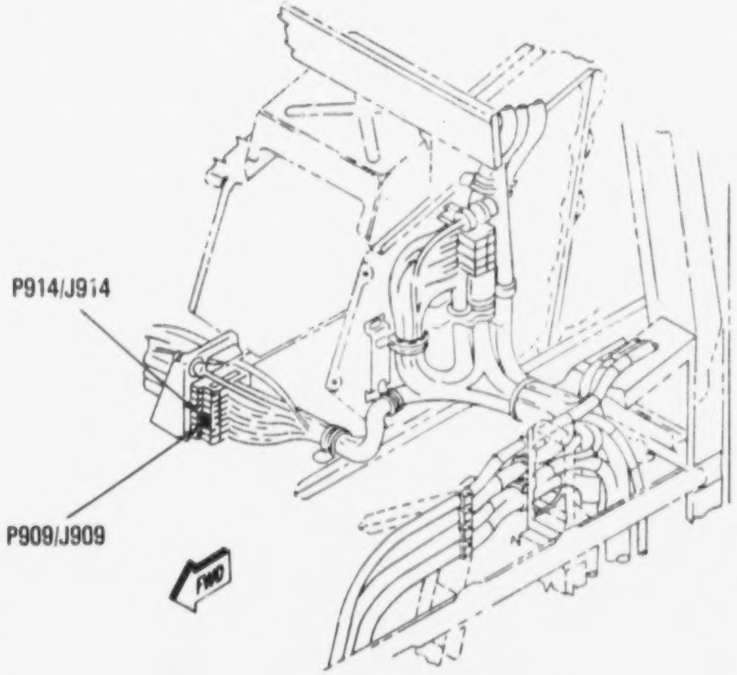
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



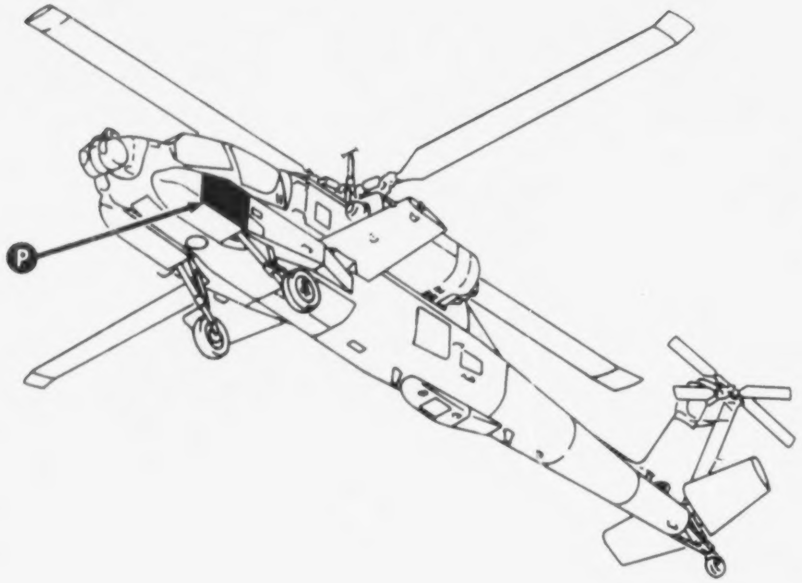


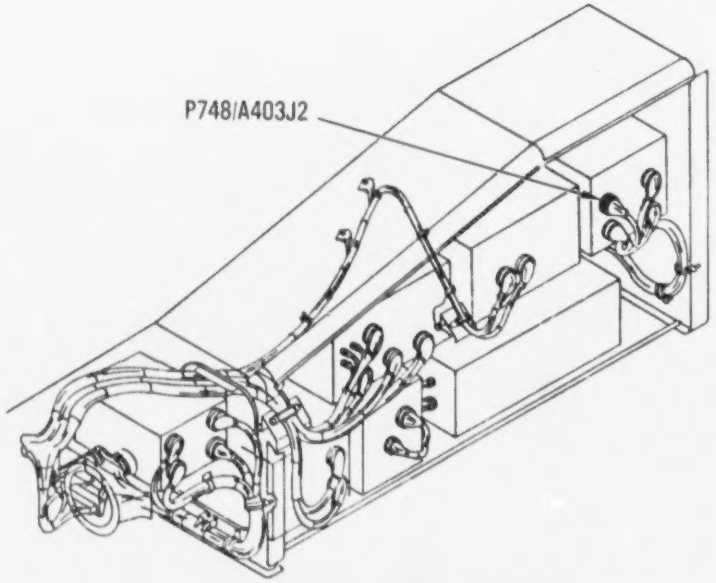


N CPG INSTRUMENT PANEL



O PILOT/CPG CROSSOVER

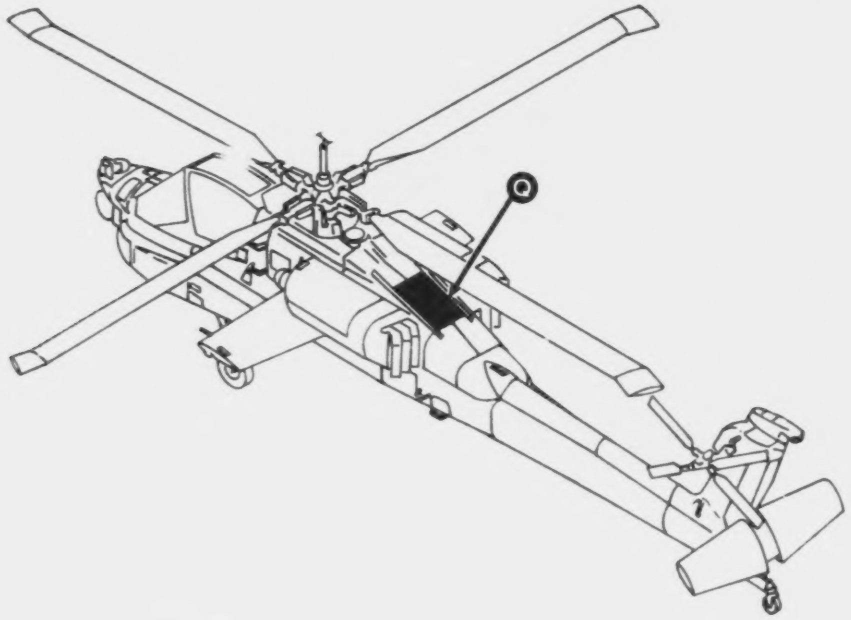


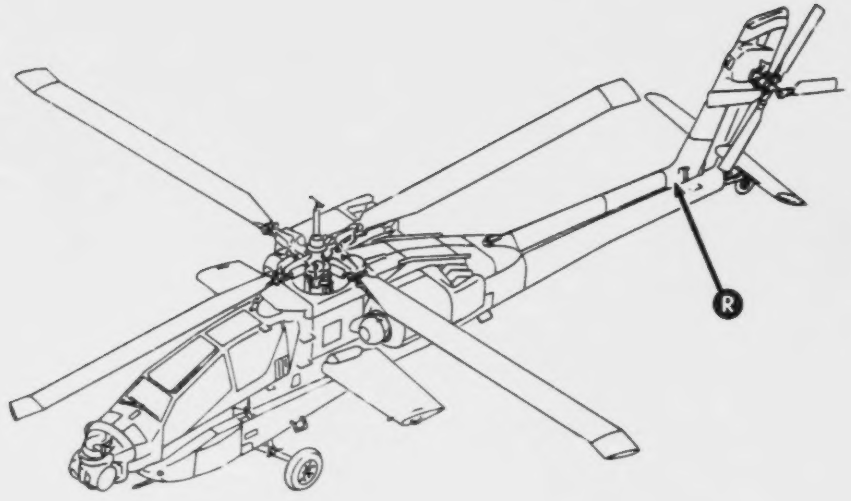


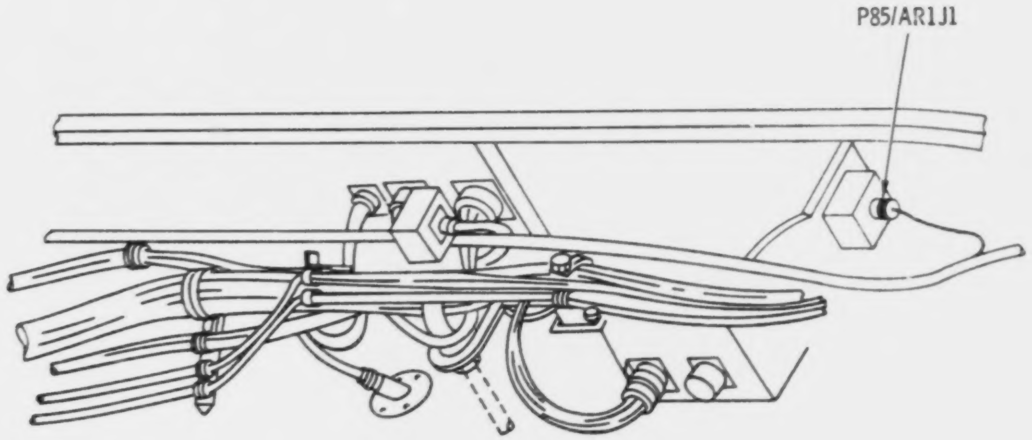
P LEFT HAND FORWARD AVIONICS BAY

MM04/1-1102-4A

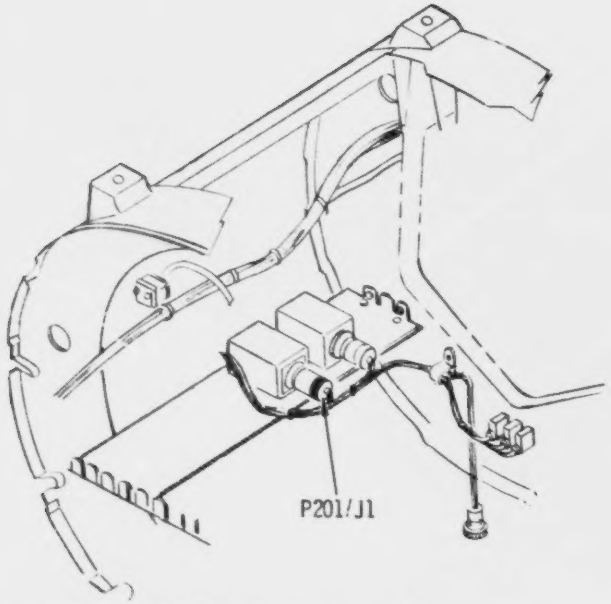
9-31-3. PILOT CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)







Q AFT MAIN DECK RIGHT SIDE



R TAILBOOM THROUGH COVERS L545, R545

MM04/1-1102-5B

9-31-4. LT CAUT CIRCUIT BREAKER (CB21) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, AN/URM-105C	6625-00-999-6282

Personnel Required:

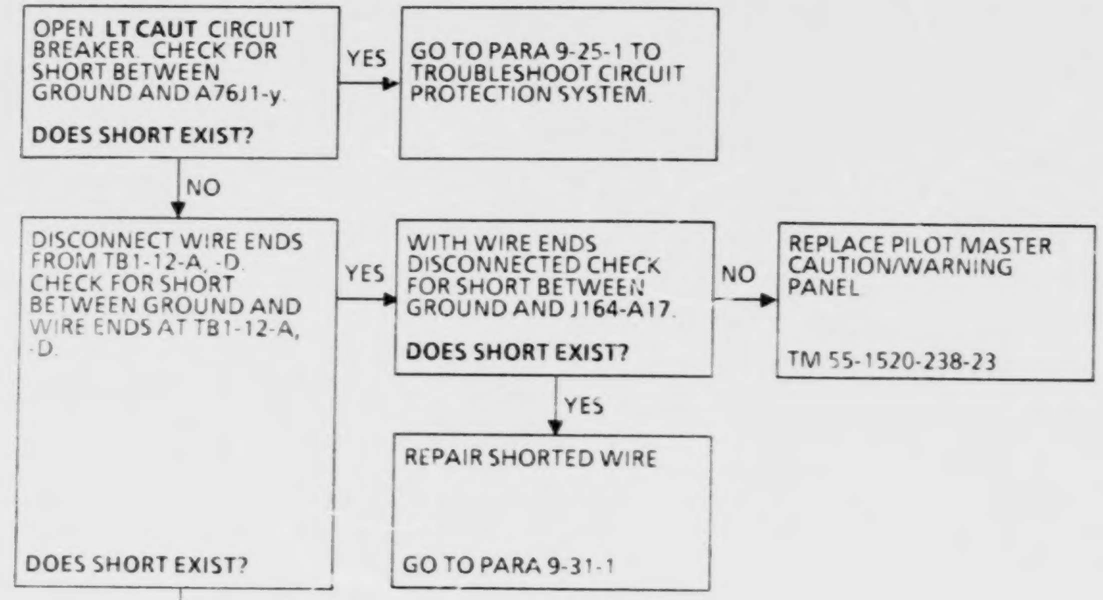
68F10 Aircraft Electrician
One person to assist

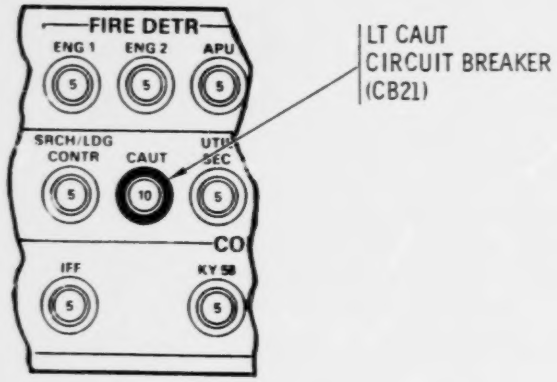
References:

TM 55-1520-238-23

Equipment Conditions:

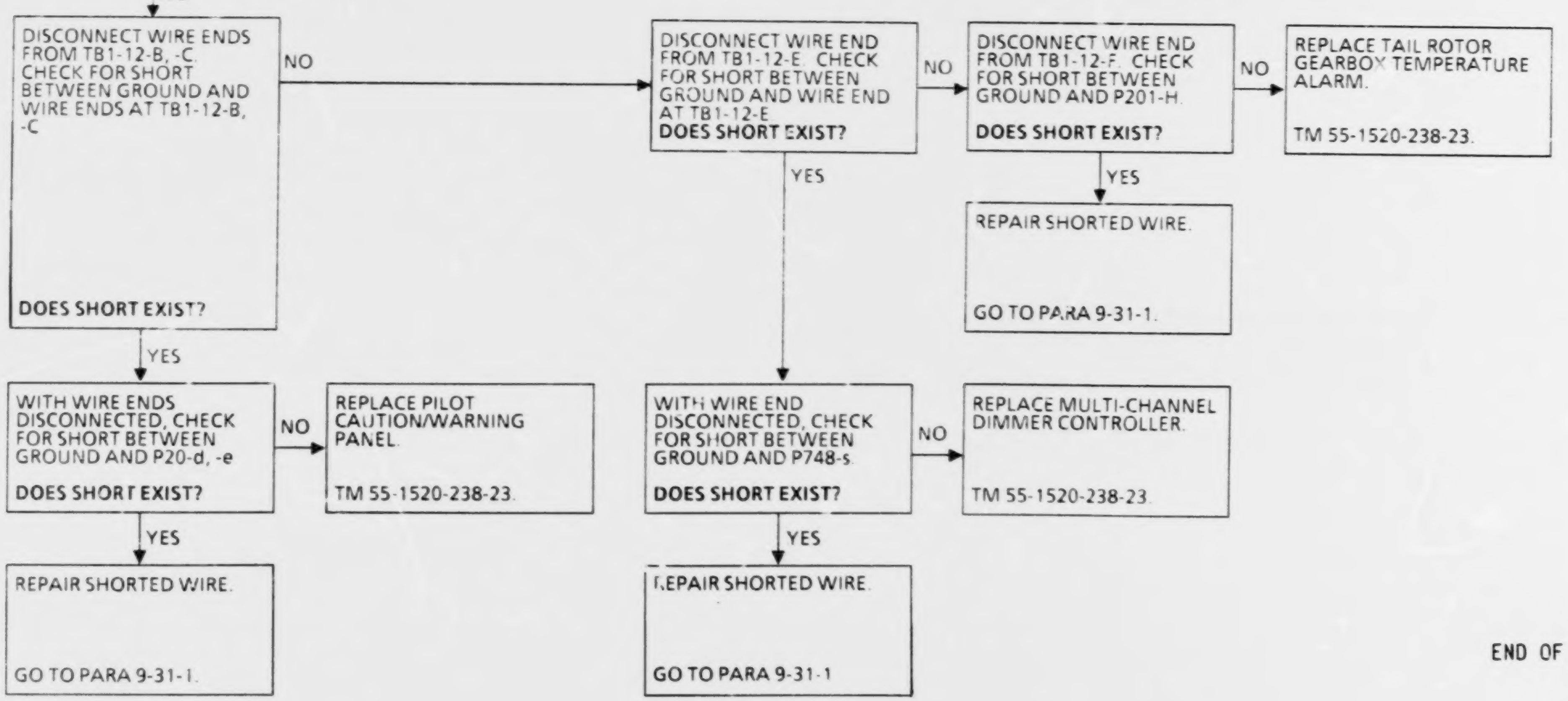
Ref	Condition
TM 55-1520-238-23	Helicopter safed


OPEN LT CAUT CIRCUIT BREAKER. CHECK FOR SHORT BETWEEN GROUND AND A76J1-y.
DOES SHORT EXIST?
YES
GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
NO
DISCONNECT WIRE ENDS FROM TB1-12-A, -D. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS AT TB1-12-A, -D.
DOES SHORT EXIST?
YES
WITH WIRE ENDS DISCONNECTED CHECK FOR SHORT BETWEEN GROUND AND J164-A17.
DOES SHORT EXIST?
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL
TM 55-1520-238-23
YES
REPAIR SHORTED WIRE
GO TO PARA 9-31-1
NO



PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1103


DISCONNECT WIRE ENDS FROM TB1-12-B, -C. CHECK FOR SHORT BETWEEN GROUND AND WIRE ENDS AT TB1-12-B, -C
DOES SHORT EXIST?
NO
DISCONNECT WIRE END FROM TB1-12-E. CHECK FOR SHORT BETWEEN GROUND AND WIRE END AT TB1-12-E
DOES SHORT EXIST?
NO
DISCONNECT WIRE END FROM TB1-12-F. CHECK FOR SHORT BETWEEN GROUND AND P201-H.
DOES SHORT EXIST?
NO
REPLACE TAIL ROTOR GEARBOX TEMPERATURE ALARM.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1.
YES
WITH WIRE ENDS DISCONNECTED, CHECK FOR SHORT BETWEEN GROUND AND P20-d, -e
DOES SHORT EXIST?
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1.
YES
WITH WIRE END DISCONNECTED, CHECK FOR SHORT BETWEEN GROUND AND P748-s.
DOES SHORT EXIST?
NO
REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23.
YES
REPAIR SHORTED WIRE.
GO TO PARA 9-31-1

END OF TASK

9-31-5. PRESS TO TEST INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

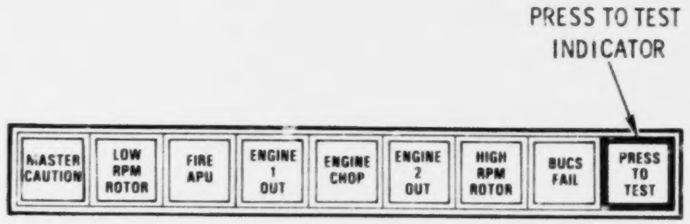
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

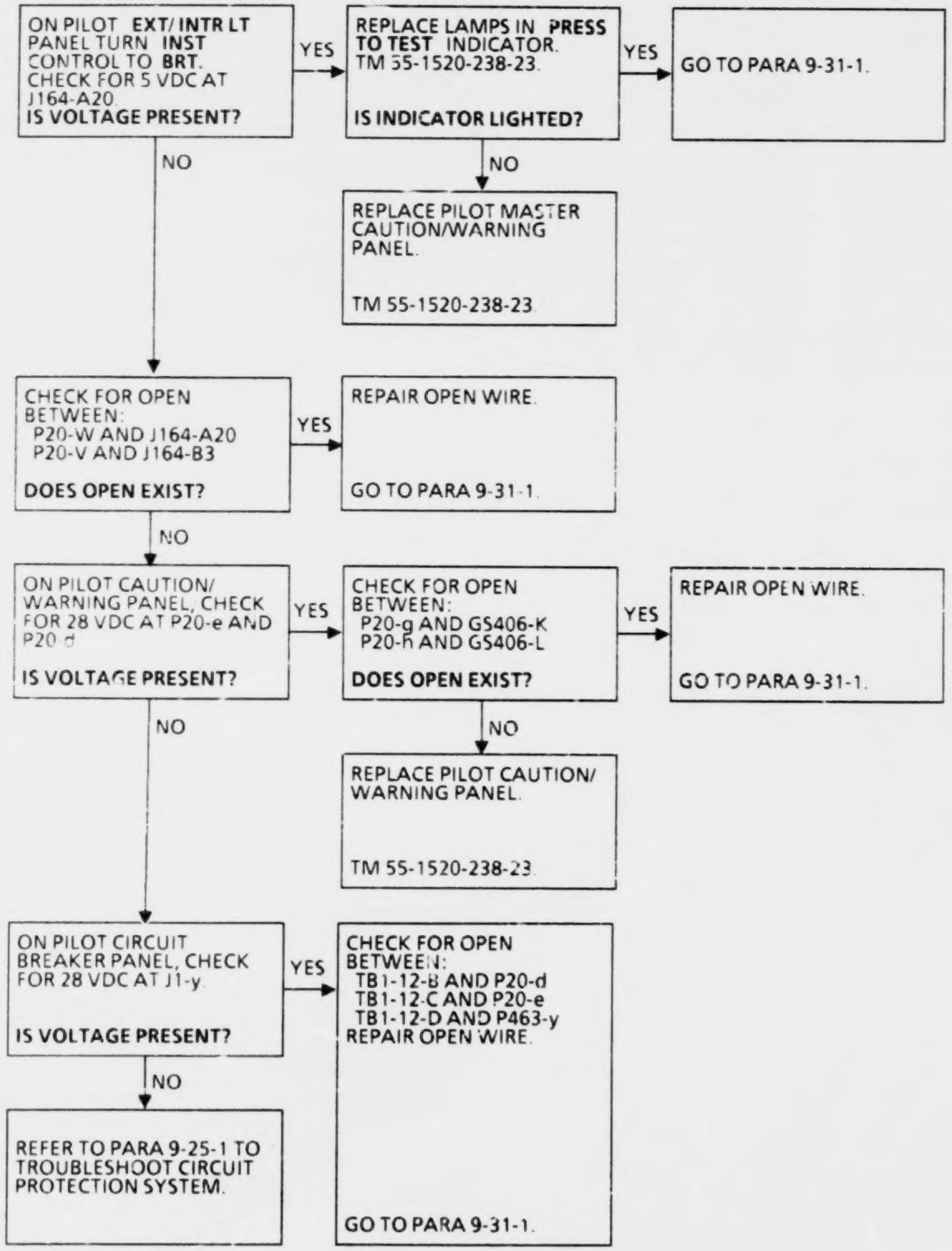
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT MASTER CAUTION / WARNING PANEL

MM04/1-1104


ON PILOT EXT/INTR LT PANEL TURN INST CONTROL TO BRT. CHECK FOR 5 VDC AT J164-A20. IS VOLTAGE PRESENT?
YES
REPLACE LAMPS IN PRESS TO TEST INDICATOR. TM 55-1520-238-23. IS INDICATOR LIGHTED?
YES
GO TO PARA 9-31-1.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN: P20-W AND J164-A20 P20-V AND J164-B3 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-31-1.
NO
ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P20-e AND P20-d. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P20-g AND GS406-K P20-h AND GS406-L DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-31-1.
NO
REPLACE PILOT CAUTION/WARNING PANEL. TM 55-1520-238-23.
NO
ON PILOT CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT J1-y. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: TB1-12-B AND P20-d TB1-12-C AND P20-e TB1-12-D AND P463-y REPAIR OPEN WIRE. GO TO PARA 9-31-1.
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-31-6. MASTER CAUTION/WARNING AND CAUTION/WARNING PANELS - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-5)

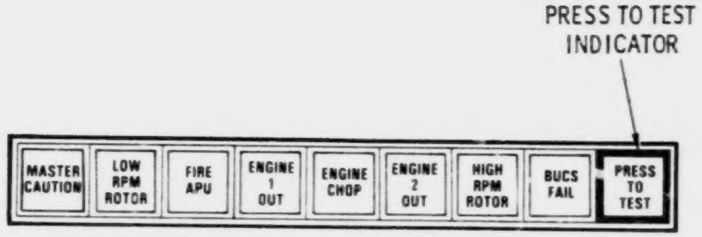
Personnel Required: (para 9-31-5)

References: (para 9-31-5)

Equipment Conditions: (para 9-31-5)

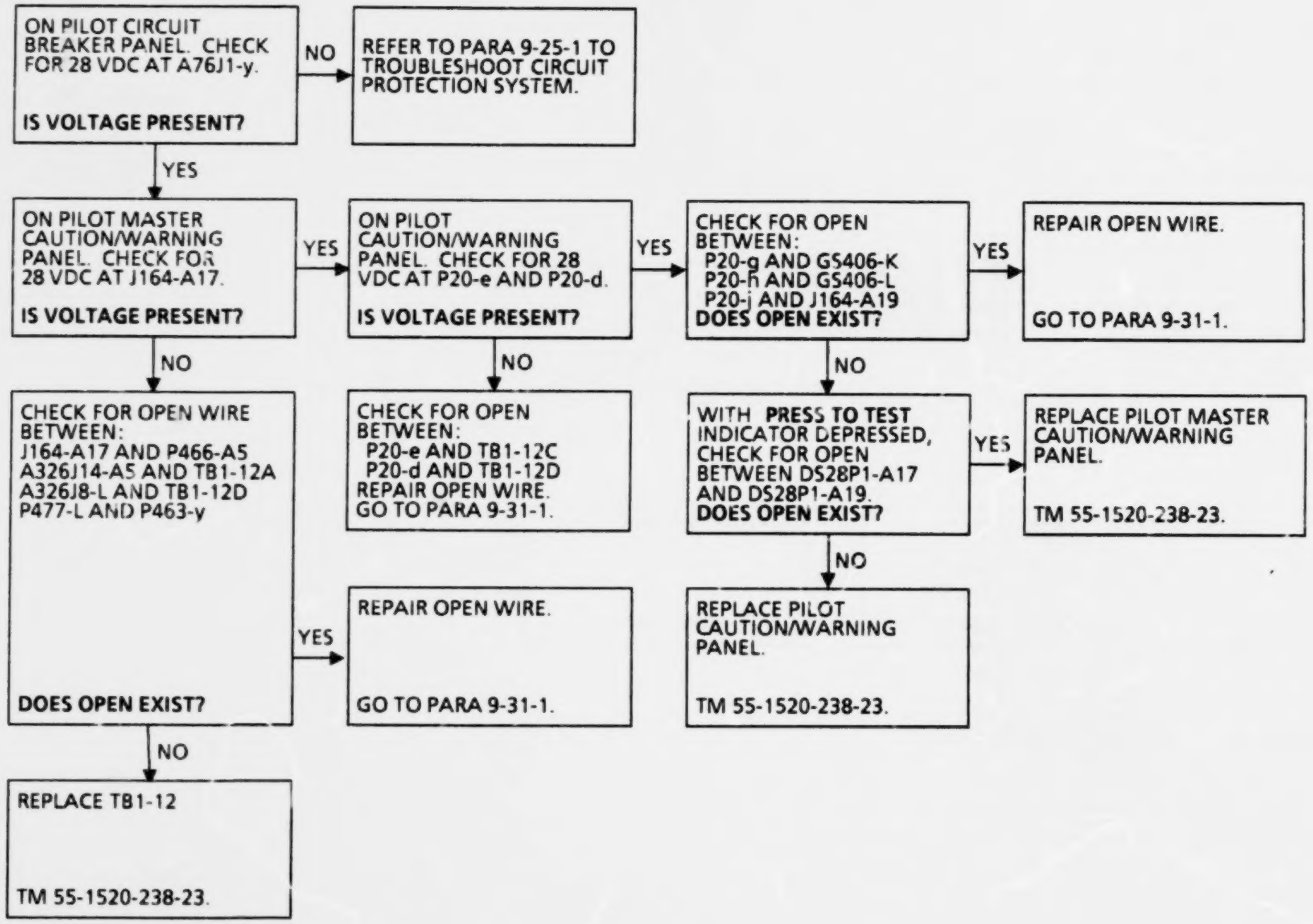
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT MASTER CAUTION / WARNING PANEL

MM04/1-1105


ON PILOT CIRCUIT BREAKER PANEL. CHECK FOR 28 VDC AT A76J1-y.
IS VOLTAGE PRESENT?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
ON PILOT MASTER CAUTION/WARNING PANEL. CHECK FOR 28 VDC AT J164-A17.
IS VOLTAGE PRESENT?
YES
ON PILOT CAUTION/WARNING PANEL. CHECK FOR 28 VDC AT P20-e AND P20-d.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P20-g AND GS406-K P20-h AND GS406-L P20-j AND J164-A19
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
CHECK FOR OPEN WIRE BETWEEN: J164-A17 AND P466-A5 A326J14-A5 AND TB1-12A A326J8-L AND TB1-12D P477-L AND P463-y
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN: P20-e AND TB1-12C P20-d AND TB1-12D REPAIR OPEN WIRE. GO TO PARA 9-31-1.
NO
WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS28P1-A17 AND DS28P1-A19.
DOES OPEN EXIST?
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE TB1-12
TM 55-1520-238-23.

END OF TASK

9-31-7. MASTER CAUTION INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

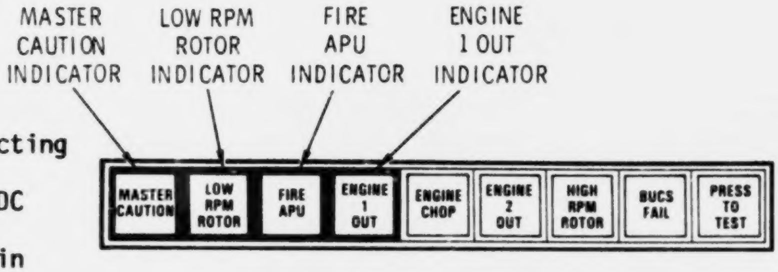
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP - completed

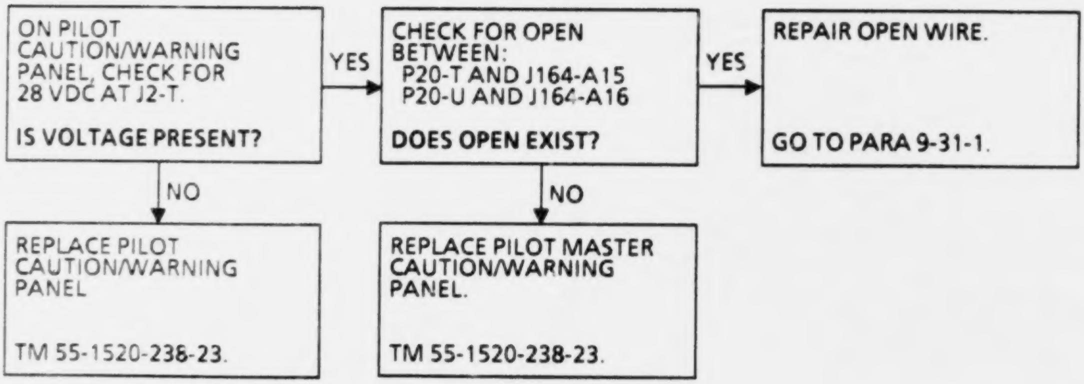
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT MASTER CAUTION/WARNING PANEL

MM04/1-1161



ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-T.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P20-T AND J164-A15
P20-U AND J164-A16

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

REPLACE PILOT CAUTION/WARNING PANEL

TM 55-1520-238-23.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TASK

9-31-8. LOW RPM ROTOR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-7)

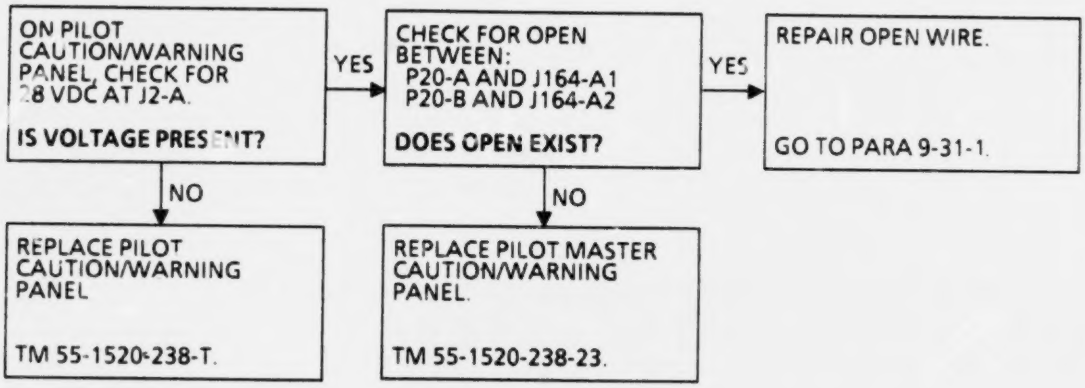
Personnel Required: (para 9-31-7)

References: (para 9-31-7)

Equipment Conditions: (para 9-31-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-31-9. FIRE APU INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-7)

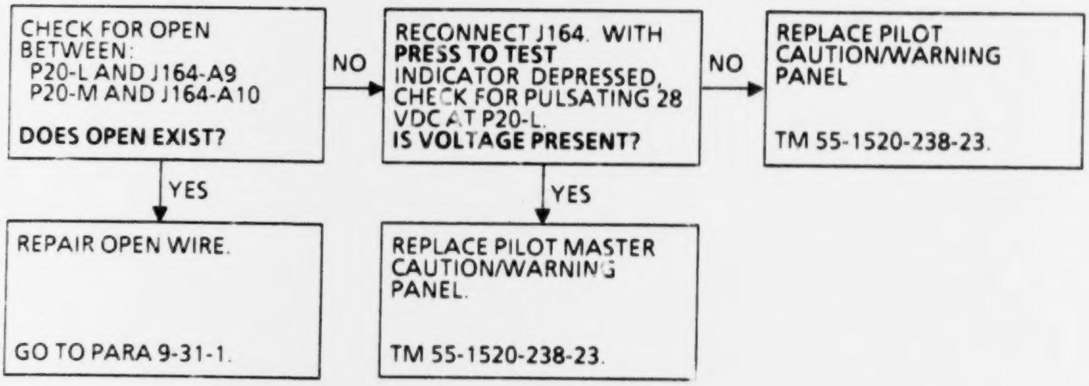
Personnel Required: (para 9-31-7)

References: (para 9-31-7)

Equipment Conditions: (para 9-31-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-31-10. ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-7)

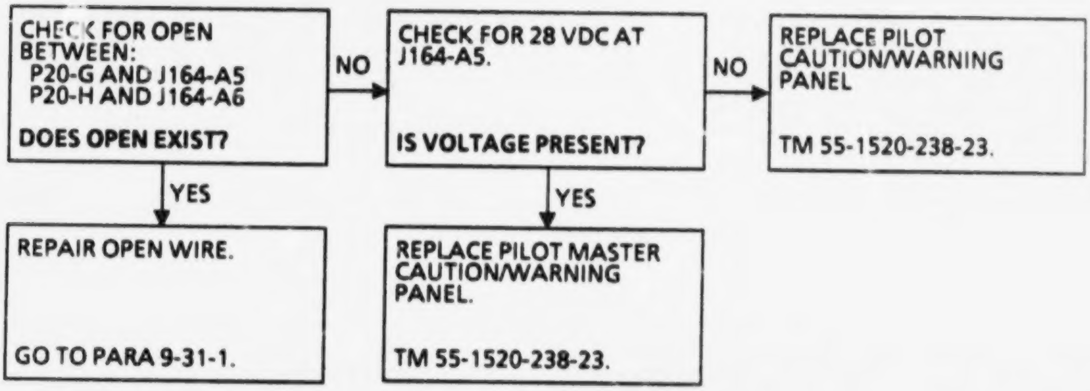
Personnel Required: (para 9-31-7)

References: (para 9-31-7)

Equipment Conditions: (para 9-31-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-31-11. ENGINE CHOP INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

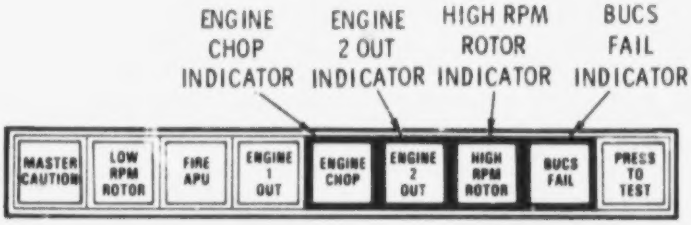
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

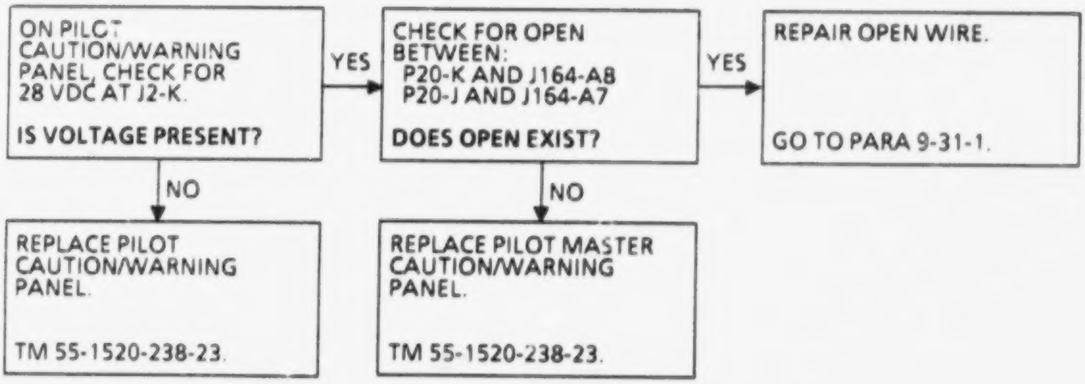
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT MASTER CAUTION/WARNING PANEL

MM04/1-1162



ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-K.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P20-K AND J164-A8
P20-J AND J164-A7

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

REPLACE PILOT CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TASK

9-31-12. ENGINE 2 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-11)

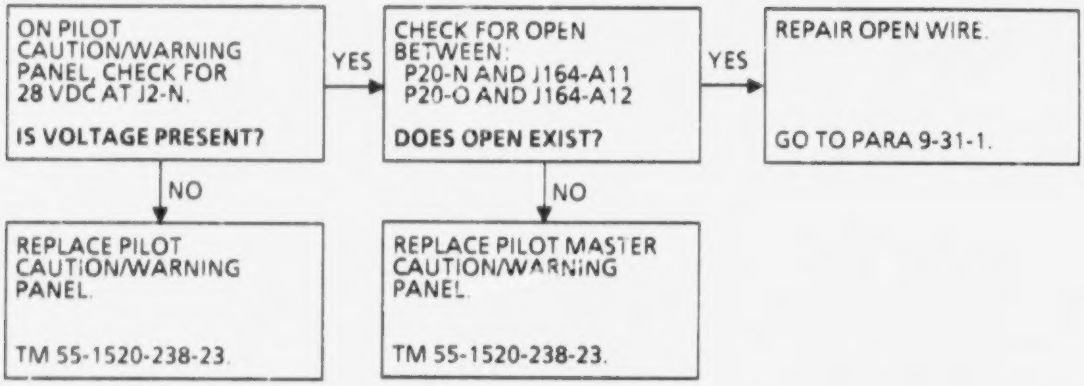
Personnel Required: (para 9-31-11)

References: (para 9-31-11)

Equipment Conditions: (para 9-31-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-31-13. HIGH RPM ROTOR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-11)

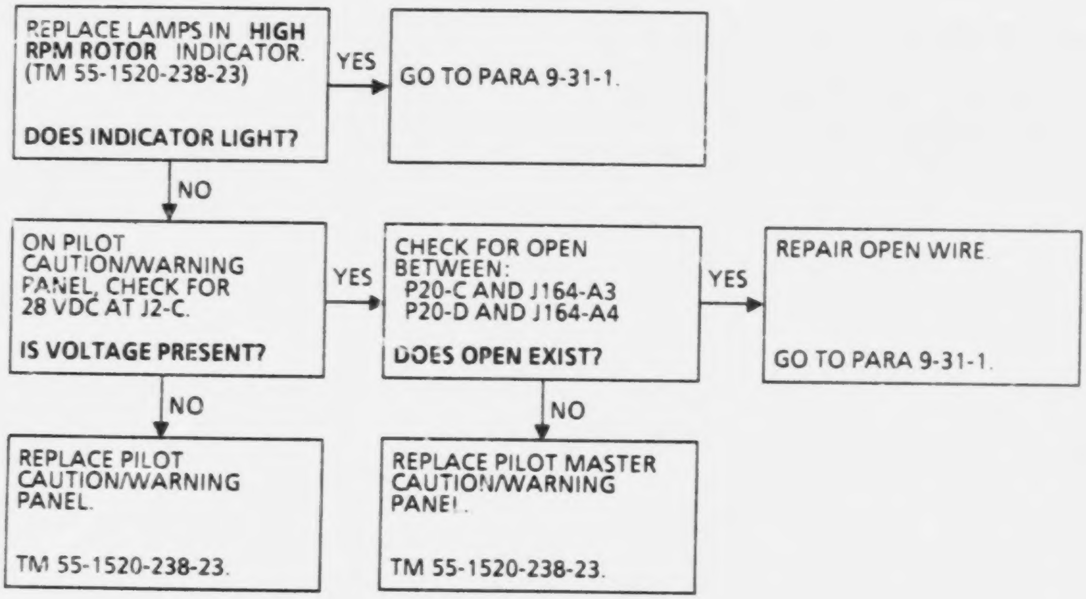
Personnel Required: (para 9-31-11)

References: (para 9-31-11)

Equipment Conditions: (para 9-31-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN HIGH RPM ROTOR INDICATOR. (TM 55-1520-238-23)
DOES INDICATOR LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-C.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P20-C AND J164-A3 P20-D AND J164-A4
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-14. BUCS FAIL INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-11))

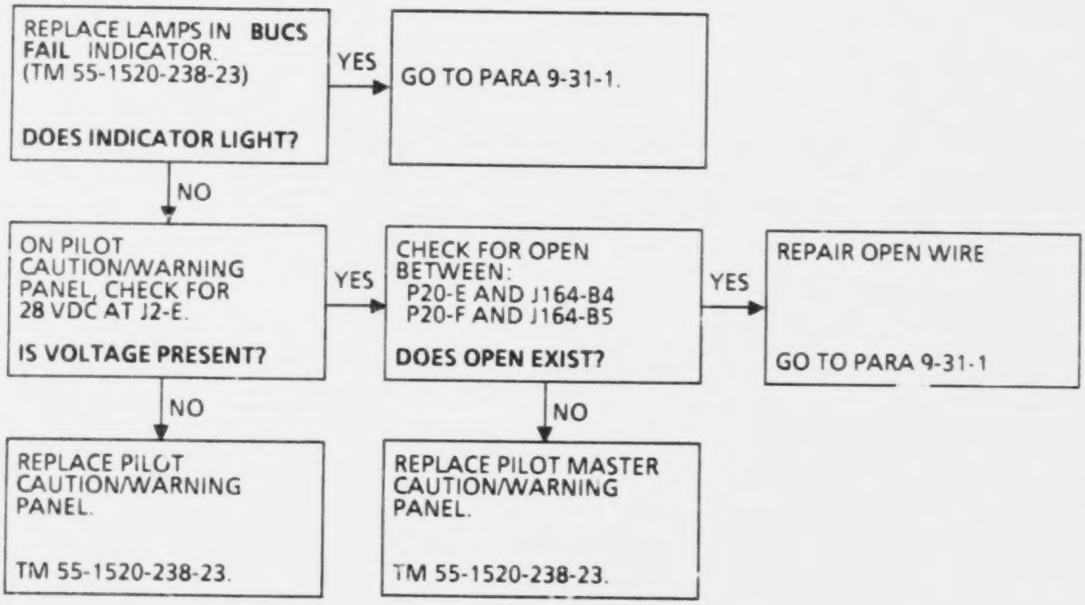
Personnel Required: (para 9-31-11)

References: (para 9-31-11)

Equipment Conditions: (para 9-31-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN BUCS FAIL INDICATOR. (TM 55-1520-238-23)
DOES INDICATOR LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON PILOT CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J2-E.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P20-E AND J164-B4 P20-F AND J164-B5
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-31-1
NO
REPLACE PILOT CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-15. PRI DISCH INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

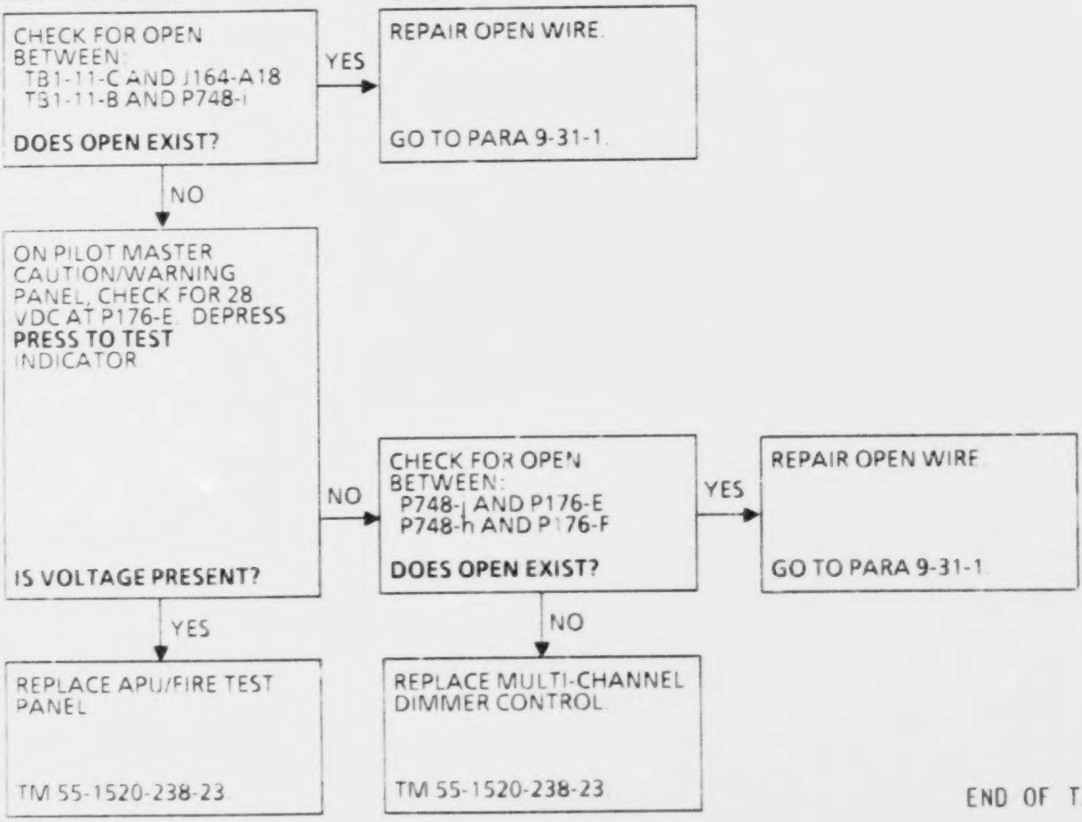
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
	Non-transparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-31-16. RES DISCH INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-15)

Personnel Required: (para 9-31-15)

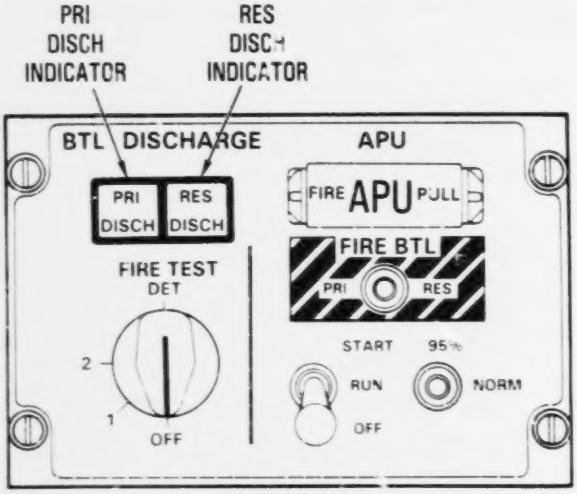
References: (para 9-31-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

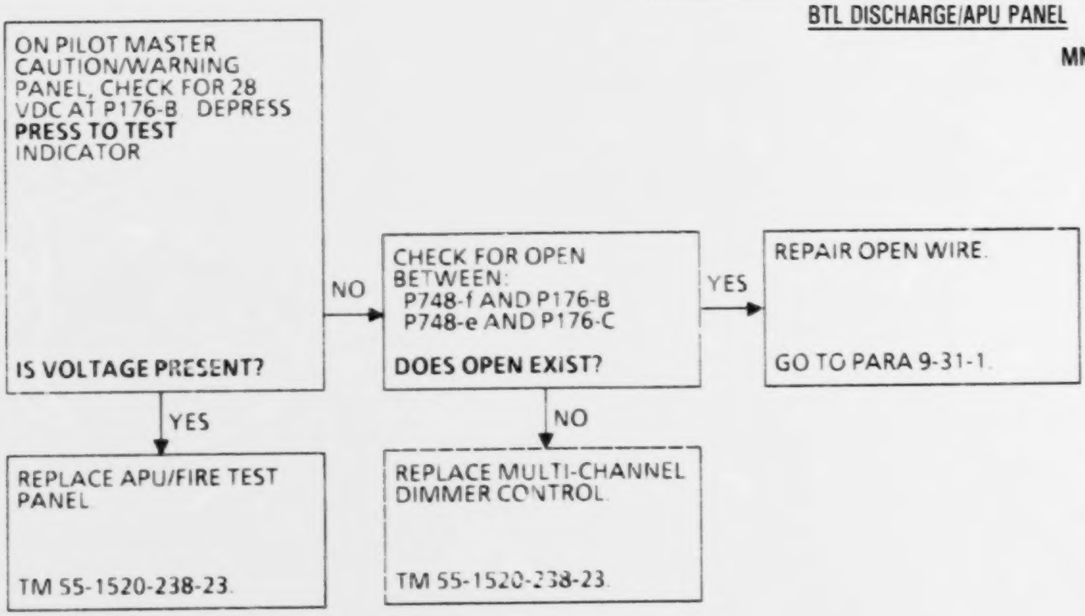
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



BTL DISCHARGE/APU PANEL

MM04/1-1163A



END OF TASK

9-31-17. ENG 1 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-15)

Personnel Required: (para 9-31-15)

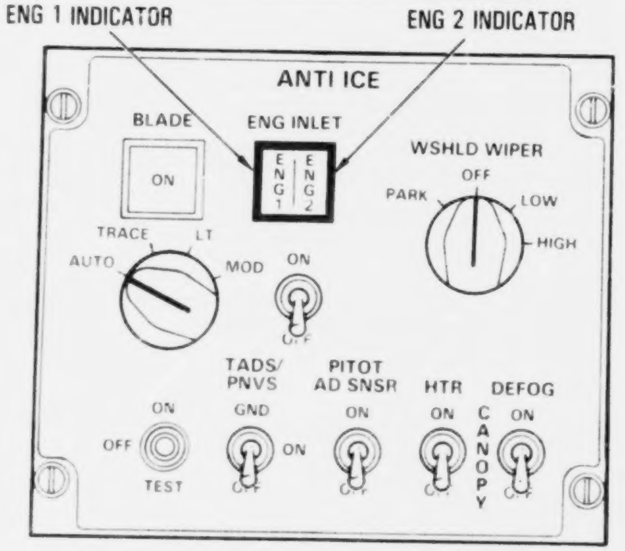
References: (para 9-31-15)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicoper safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

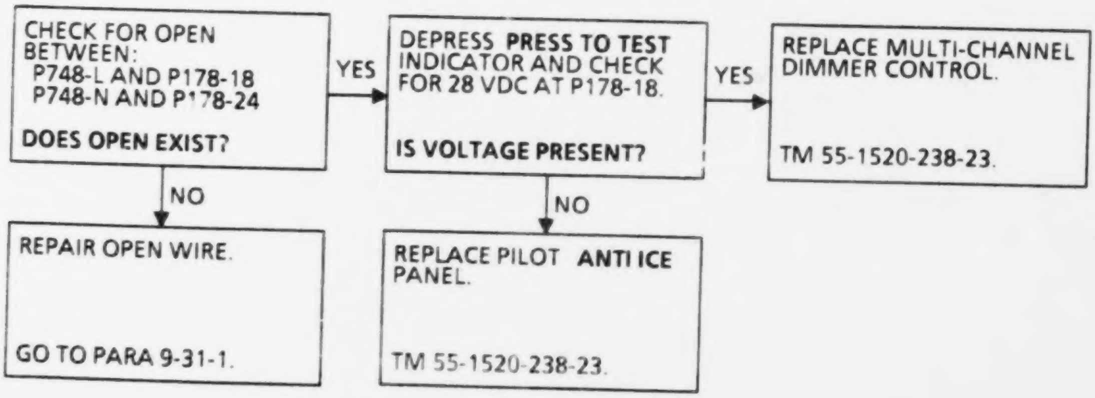
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT ANTI ICE PANEL

MM04/1-1164A



END OF TASK

9-31-18. ENGINE 2 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-15)

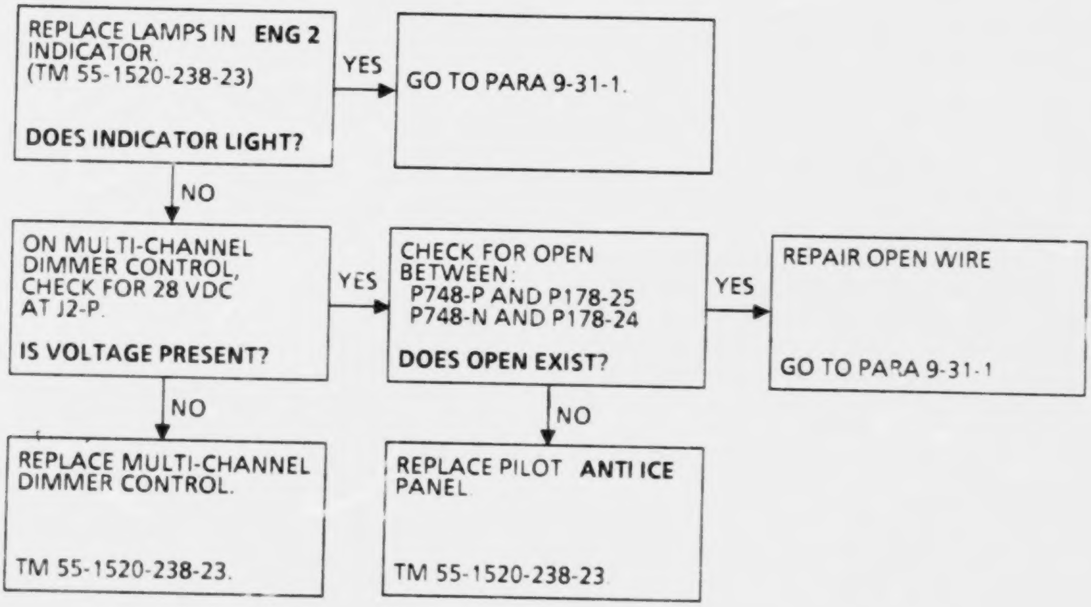
Personnel Required: (para 9-31-15)

References: (para 9-31-15)

Equipment Conditions: (para 9-31-17)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


REPLACE LAMPS IN ENG 2 INDICATOR. (TM 55-1520-238-23) DOES INDICATOR LIGHT?
YES
GO TO PARA 9-31-1.
NO
ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-P. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P748-P AND P178-25 P748-N AND P178-24 DOES OPEN EXIST?
YES
REPAIR OPEN WIRE GO TO PARA 9-31-1
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.
NO
REPLACE PILOT ANTI ICE PANEL TM 55-1520-238-23

END OF TASK

9-31-19. BLADE INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

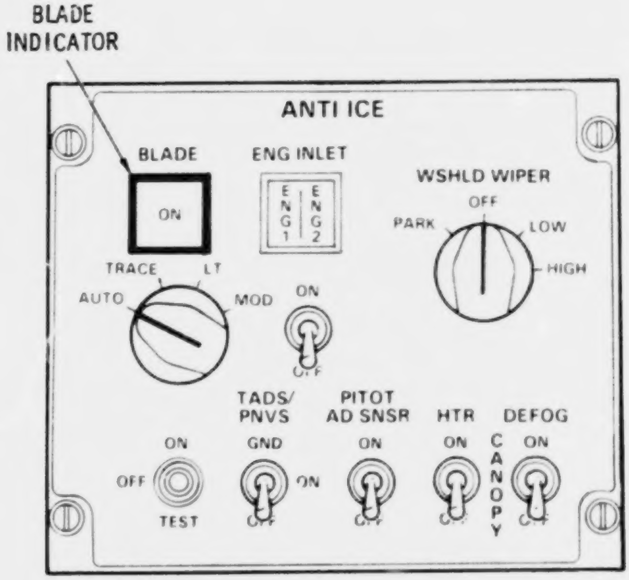
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

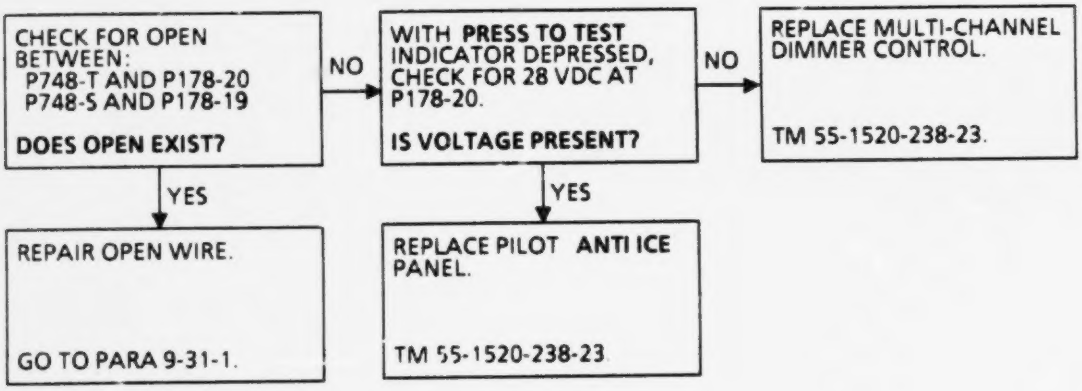
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT ANTI ICE PANEL

MM04/1-1165A


CHECK FOR OPEN BETWEEN:
P748-T AND P178-20
P748-S AND P178-19
DOES OPEN EXIST?
NO
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR 28 VDC AT P178-20.
IS VOLTAGE PRESENT?
NO
YES
REPLACE PILOT ANTI ICE PANEL.
TM 55-1520-238-23.
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.

END OF TASK

9-31-20. ENG 1 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-19)

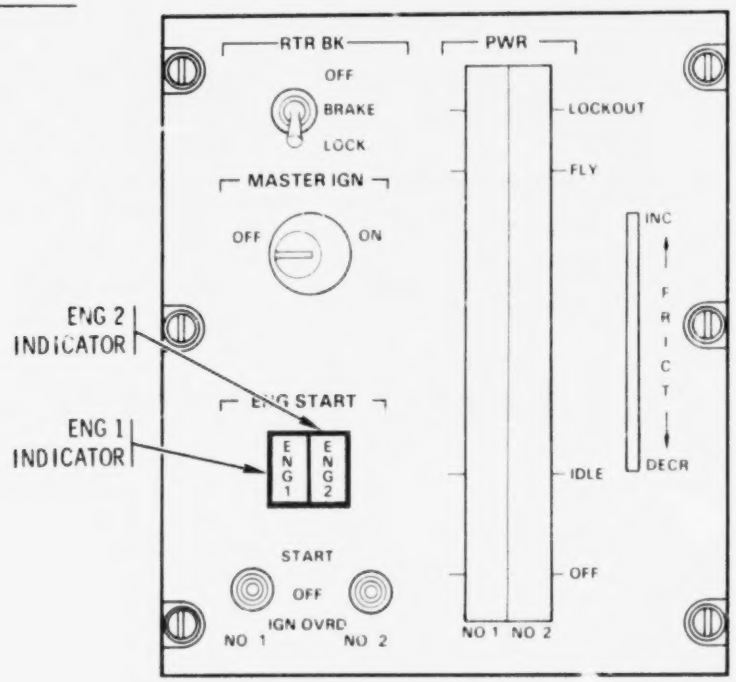
Personnel Required: (para 9-31-19)

References: (para 9-31-19)

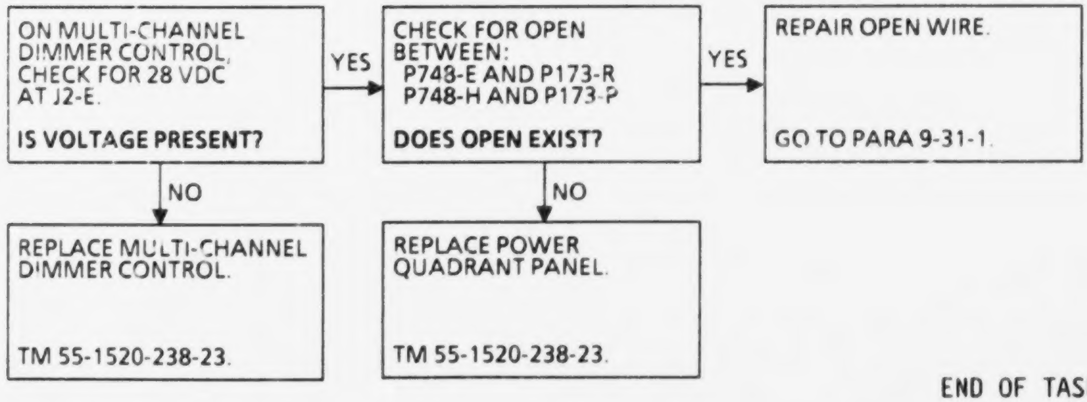
Equipment Conditions: (para 9-31-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



MM04/1-1166A


ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-E.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P748-E AND P173-R P748-H AND P173-P
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPLACE POWER QUADRANT PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-21. ENG 2 INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-19)

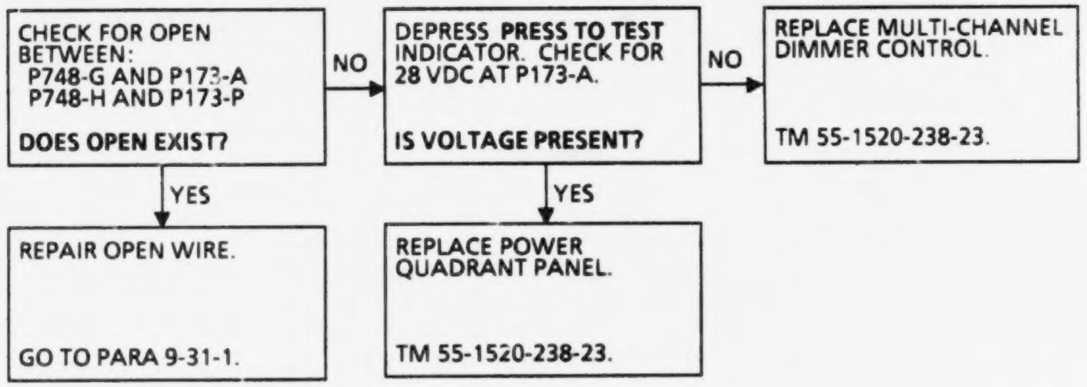
Personnel Required: (para 9-31-19)

References: (Para 9-31-19)

Equipment Conditions: (para 9-31-19)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR OPEN BETWEEN: P748-G AND P173-A P748-H AND P173-P
DOES OPEN EXIST?
NO
DEPRESS PRESS TO TEST INDICATOR. CHECK FOR 28 VDC AT P173-A.
IS VOLTAGE PRESENT?
NO
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
YES
REPLACE POWER QUADRANT PANEL.
TM 55-1520-238-23.

END OF TASK

9-31-22. EMERG PWR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

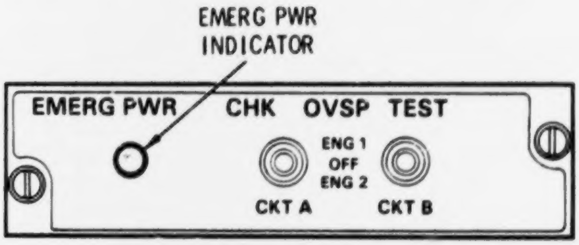
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

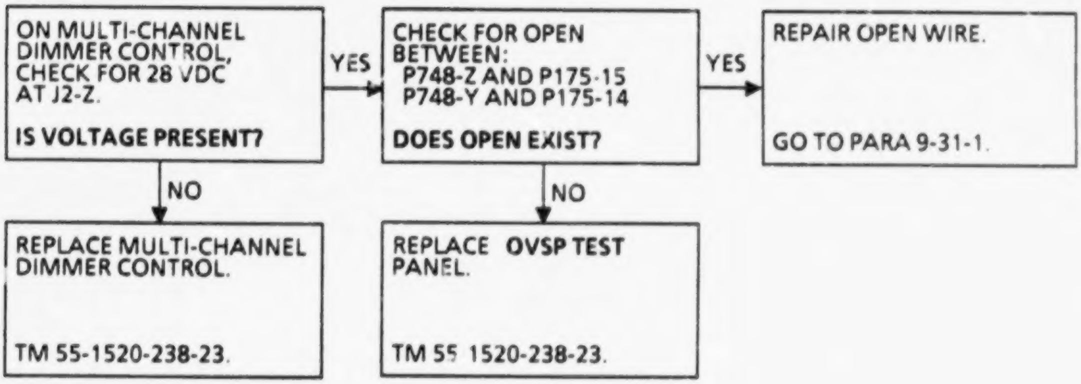
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



OVSP TEST PANEL

MM04/1-1167A



ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-Z.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P748-Z AND P175-15
P748-Y AND P175-14

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

REPLACE **OVSP TEST** PANEL.

TM 55-1520-238-23.

END OF TASK

9-31-23. ROCKET PANEL INDICATORS - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-22)

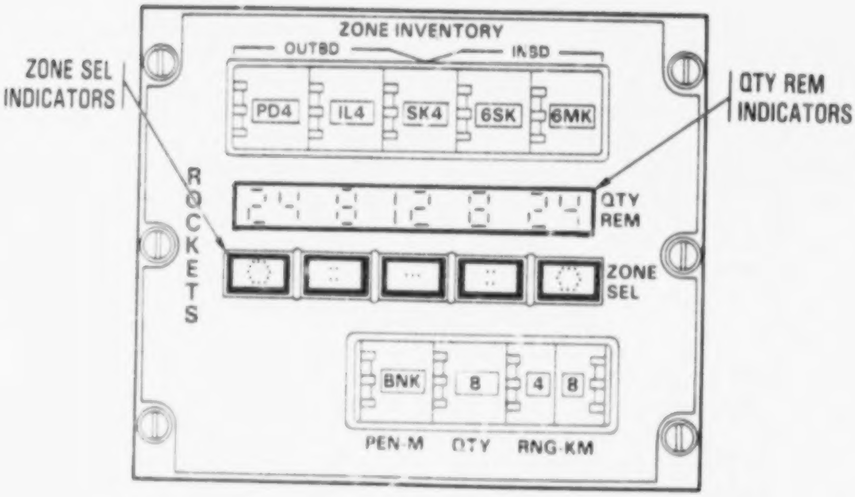
Personnel Required: (para 9-31-22)

References:

TM 55-1520-238-23
TM 9-1090-208-23-1

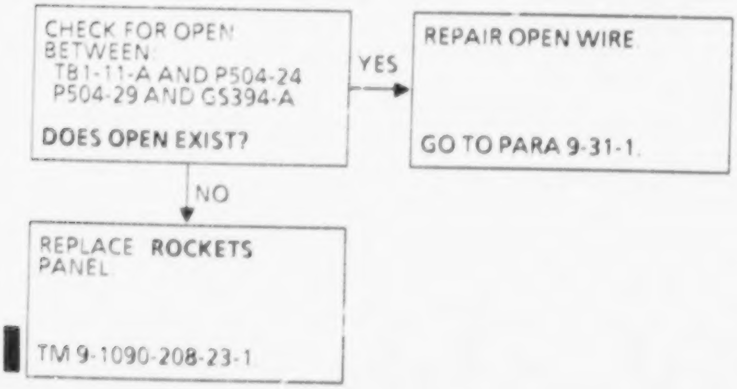
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Non-transparent barrier removed



ROCKETS PANEL

MM04/1-1168A



CHECK FOR OPEN BETWEEN:
TB1-11-A AND P504-24
P504-29 AND GS394-A

DOES OPEN EXIST?

YES

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

NO

REPLACE ROCKETS PANEL.

TM 9-1090-208-23-1

END OF TASK

9-31-24. TAIL WHEEL INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-22)

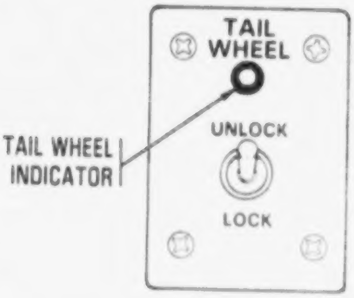
Personnel Required: (para 9-31-22)

References: (para 9-31-22)

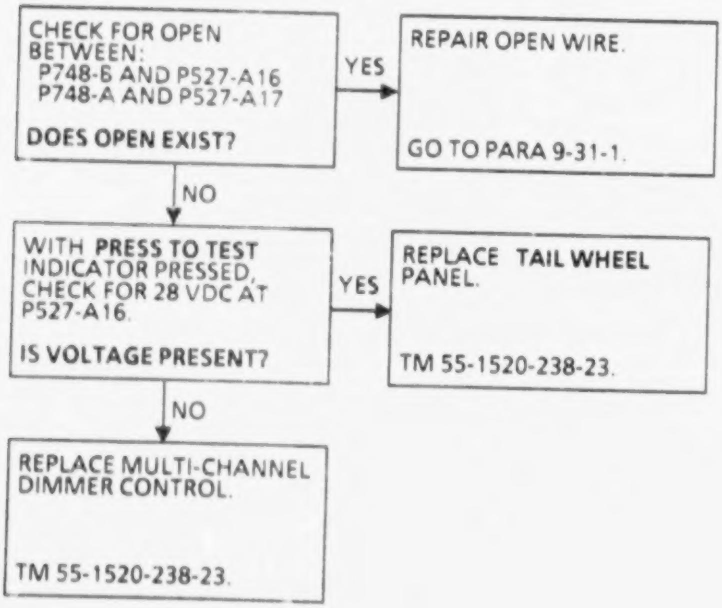
Equipment Conditions: (para 9-31-22)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



TAIL WHEEL PANEL MM04/1-1151



CHECK FOR OPEN BETWEEN:
P748-B AND P527-A16
P748-A AND P527-A17

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

WITH PRESS TO TEST INDICATOR PRESSED, CHECK FOR 28 VDC AT P527-A16.

IS VOLTAGE PRESENT?

REPLACE TAIL WHEEL PANEL.

TM 55-1520-238-23.

REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

END OF TASK

9-31-25. ARM/SAFE INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

TM 55-1520-238-23
TM 9-1230-476-20-1

Equipment Conditions:

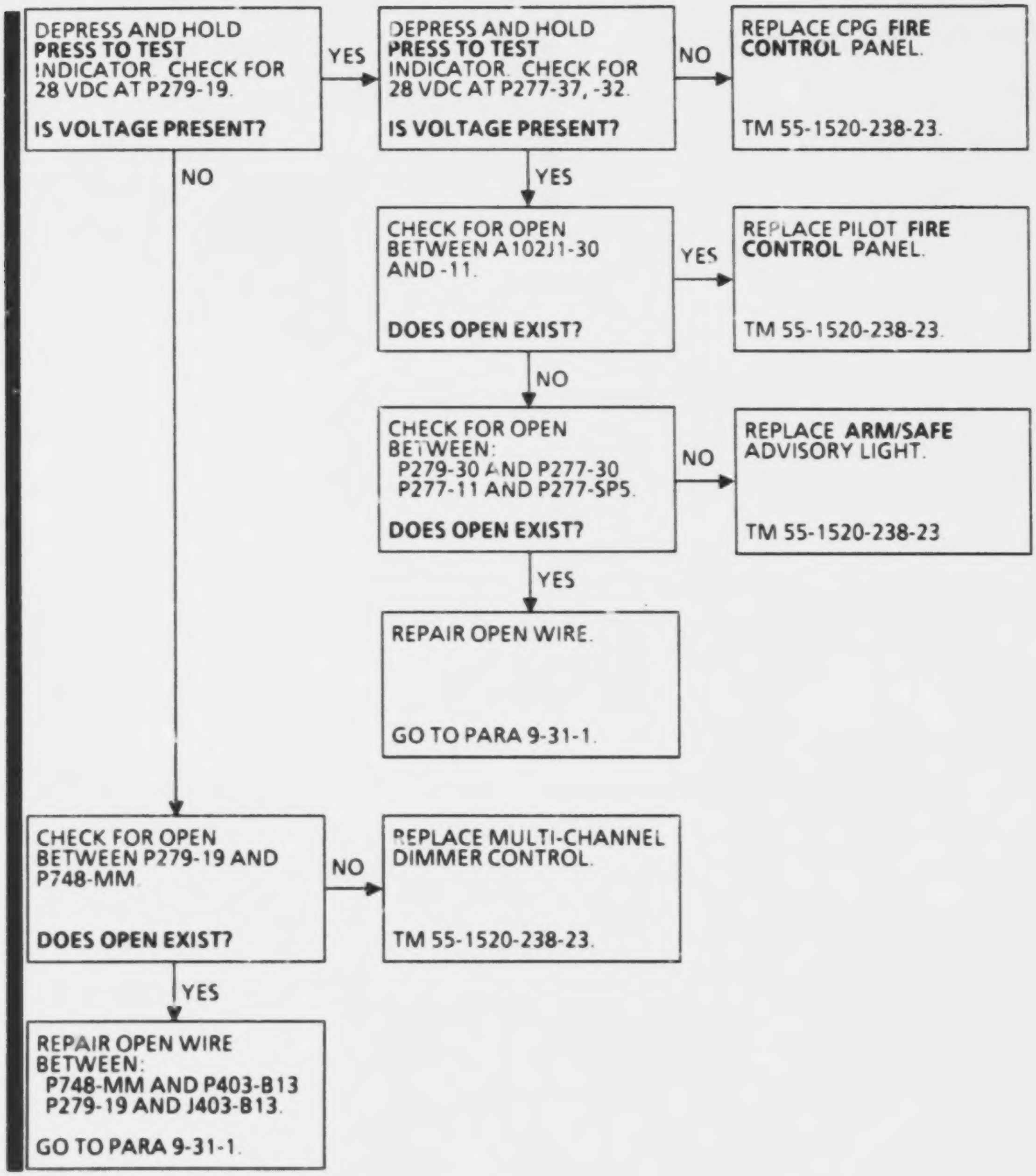
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

ARM/SAFE ADVISORY LIGHT
(TYPICAL)

MM04/1-1169



DEPRESS AND HOLD **PRESS TO TEST** INDICATOR. CHECK FOR 28 VDC AT P279-19.

IS VOLTAGE PRESENT?

DEPRESS AND HOLD **PRESS TO TEST** INDICATOR. CHECK FOR 28 VDC AT P277-37, -32.

IS VOLTAGE PRESENT?

REPLACE CPG **FIRE CONTROL** PANEL.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN A102J1-30 AND -11.

DOES OPEN EXIST?

REPLACE PILOT **FIRE CONTROL** PANEL.

TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN:
P279-30 AND P277-30
P277-11 AND P277-SP5.

DOES OPEN EXIST?

REPLACE **ARM/SAFE** ADVISORY LIGHT.

TM 55-1520-238-23

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

CHECK FOR OPEN BETWEEN P279-19 AND P748-MM.

DOES OPEN EXIST?

REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

REPAIR OPEN WIRE BETWEEN:
P748-MM AND P403-B13
P279-19 AND J403-B13.

GO TO PARA 9-31-1.

END OF TASK

9-31-26. FIRE PULL ENG 1 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-25)

Personnel Required: (para 9-31-25)

References:

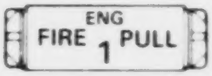
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

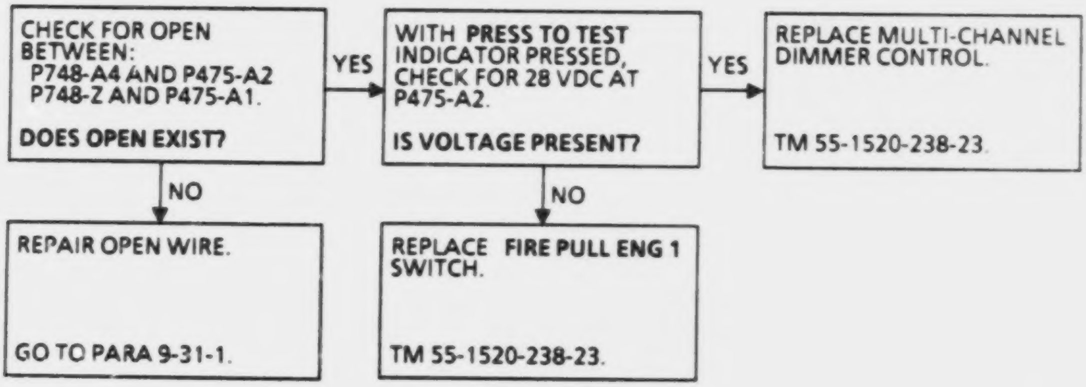
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



FIRE PULL ENG 1 SWITCH

MM04/1-1170


CHECK FOR OPEN BETWEEN: P748-A4 AND P475-A2 P748-Z AND P475-A1.
DOES OPEN EXIST?
YES
WITH PRESS TO TEST INDICATOR PRESSED, CHECK FOR 28 VDC AT P475-A2.
IS VOLTAGE PRESENT?
YES
REPLACE MULTI-CHANNEL DIMMER CONTROL.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE.
GO TO PARA 9-31-1.
NO
REPLACE FIRE PULL ENG 1 SWITCH.
TM 55-1520-238-23.

END OF TASK

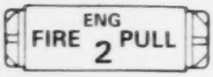
9-31-27. FIRE PULL ENG 2 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-25)

Personnel Required: (para 9-31-25)

References: (para 9-31-26)

Equipment Conditions: (para 9-31-26)

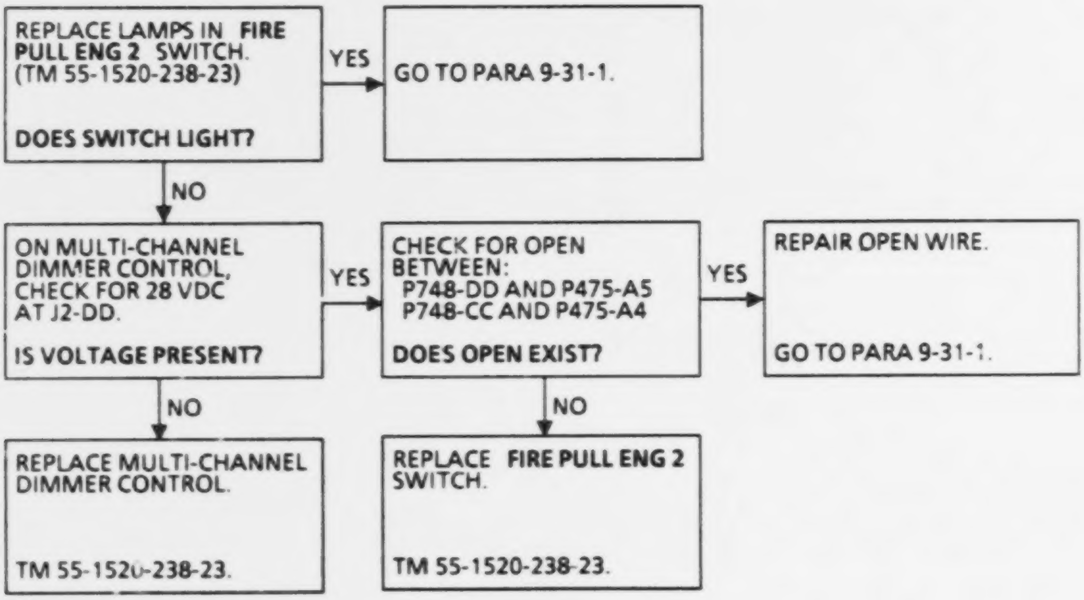


FIRE PULL ENG 2 SWITCH

MM04/1-1152

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



REPLACE LAMPS IN **FIRE PULL ENG 2** SWITCH. (TM 55-1520-238-23)

DOES SWITCH LIGHT?

YES

GO TO PARA 9-31-1.

NO

ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-DD.

IS VOLTAGE PRESENT?

YES

CHECK FOR OPEN BETWEEN:
P748-DD AND P475-A5
P748-CC AND P475-A4

DOES OPEN EXIST?

YES

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

NO

REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

NO

REPLACE **FIRE PULL ENG 2** SWITCH.

TM 55-1520-238-23.

END OF TASK

9-31-28. MA INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer's	5180-00-32[illegible]4915

Personnel Required:

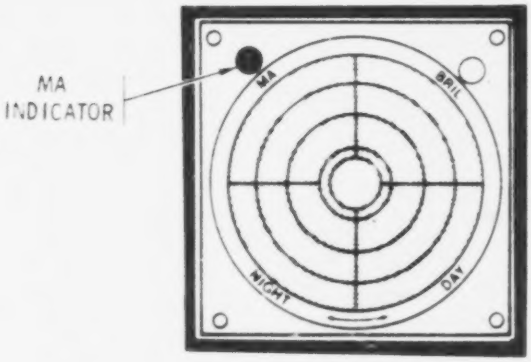
68F10 Aircraft Electrician (2)
One to assist

References:

TM 55-1520-238-23
TM 11-1520-238-23-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door opened
	External power application - Electrical

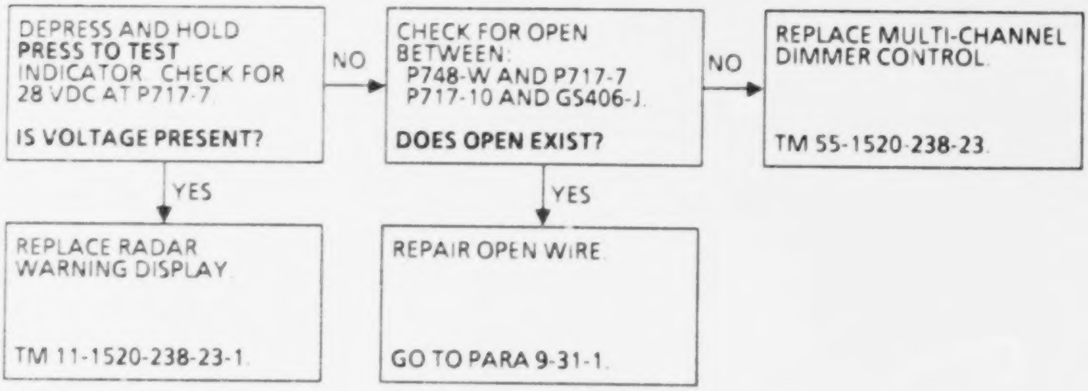


RADAR WARNING DISPLAY

MM04/1-1171

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


DEPRESS AND HOLD **PRESS TO TEST** INDICATOR. CHECK FOR 28 VDC AT P717-7.

IS VOLTAGE PRESENT?

YES: REPLACE RADAR WARNING DISPLAY. TM 11-1520-238-23-1.

NO: CHECK FOR OPEN BETWEEN:
P748-W AND P717-7
P717-10 AND GS406-J.

DOES OPEN EXIST?

YES: REPAIR OPEN WIRE. GO TO PARA 9-31-1.

NO: REPLACE MULTI-CHANNEL DIMMER CONTROL. TM 55-1520-238-23.

END OF TASK

9-31-29. RADAR WARNING CONTROL PANEL SELF TEST INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-28)

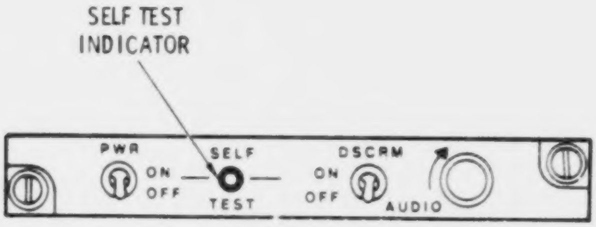
Personnel Required: (para 9-31-28)

References: (para 9-31-28)

Equipment Conditions: (para 9-31-28)

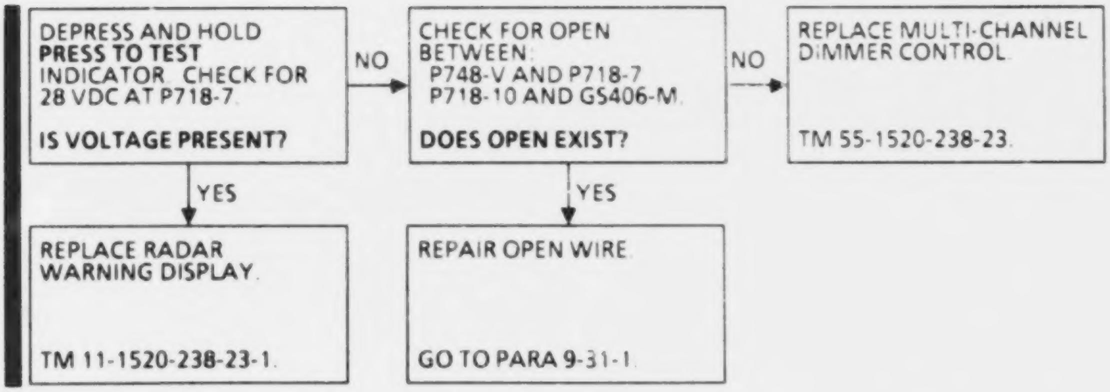
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



RADAR WARNING CONTROL PANEL

MM04/1-1153A



DEPRESS AND HOLD **PRESS TO TEST** INDICATOR. CHECK FOR 28 VDC AT P718-7.

IS VOLTAGE PRESENT?

NO → CHECK FOR OPEN BETWEEN:
P748-V AND P718-7
P718-10 AND GS406-M.

DOES OPEN EXIST?

NO → REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

YES → REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

YES → REPLACE RADAR WARNING DISPLAY.

TM 11-1520-238-23-1.

END OF TASK

9-31-30. REMOTE TRANSMIT SELECT INDICATOR(S) - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-31-28)

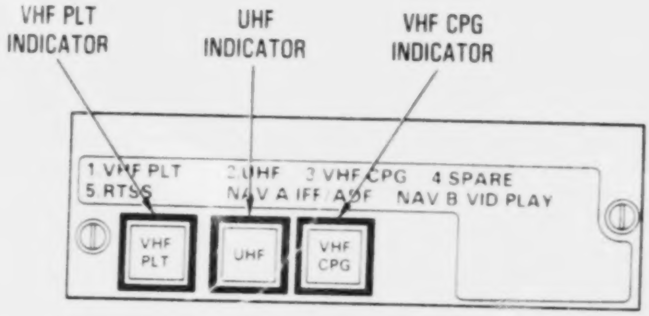
Personnel Required: (para 9-31-28)

References: (para 9-31-28)

Equipment Conditions: (para 9-31-29)

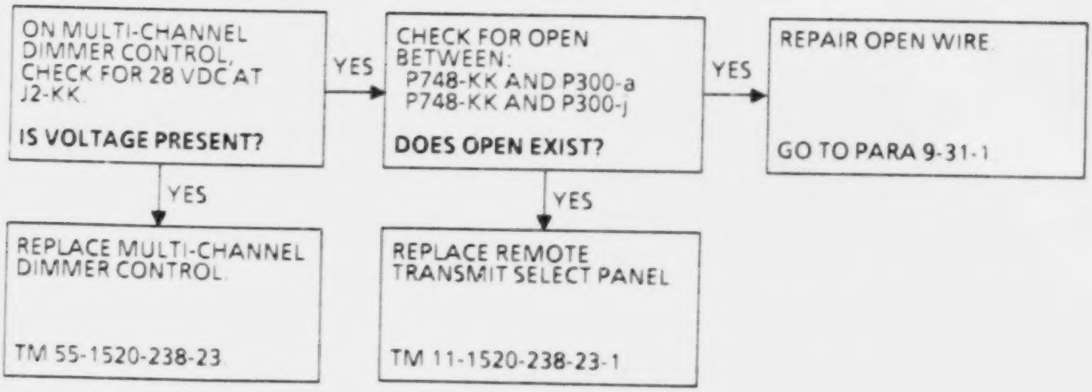
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



REMOTE TRANSMIT SELECT PANEL

MM04/1-1172



ON MULTI-CHANNEL DIMMER CONTROL, CHECK FOR 28 VDC AT J2-KK.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P748-KK AND P300-a
P748-KK AND P300-j

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-31-1

REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23

REPLACE REMOTE TRANSMIT SELECT PANEL

TM 11-1520-238-23-1

END OF TASK

9-31-31. MASTER CAUTION INDICATOR - DOES NOT RESET CAUTION INDICATORS

Tools: (para 9-31-28)

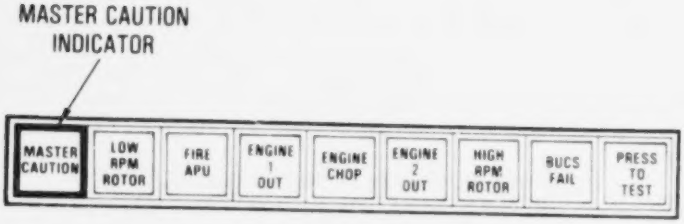
Personnel Required: (para 9-31-28)

References:

TM 55-1520-238-23

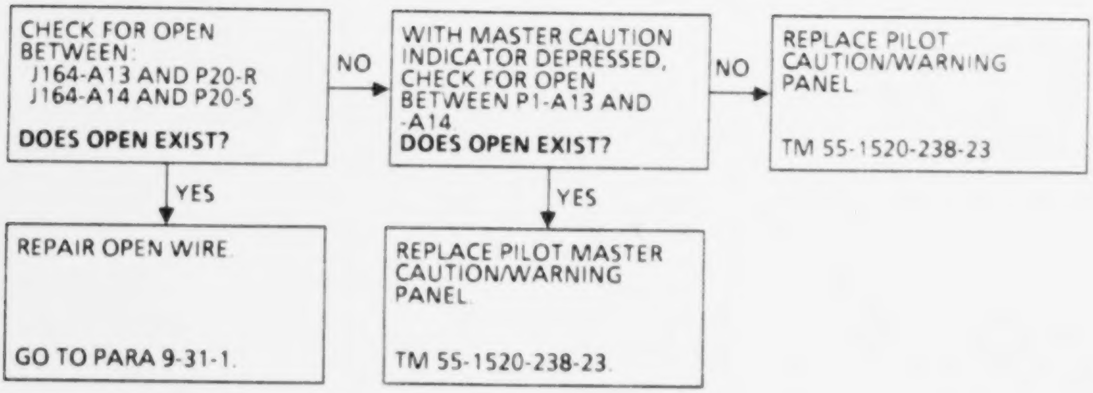
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



MASTER CAUTION/WARNING PANEL

MM04/1-1154


CHECK FOR OPEN BETWEEN:
J164-A13 AND P20-R
J164-A14 AND P20-S
DOES OPEN EXIST?

WITH MASTER CAUTION INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN P1-A13 AND -A14
DOES OPEN EXIST?

REPLACE PILOT CAUTION/WARNING PANEL

TM 55-1520-238-23

REPAIR OPEN WIRE.

GO TO PARA 9-31-1.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TASK

9-31-32. APU FIRE PULL HANDLE - DOES NOT LIGHT WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician

References:

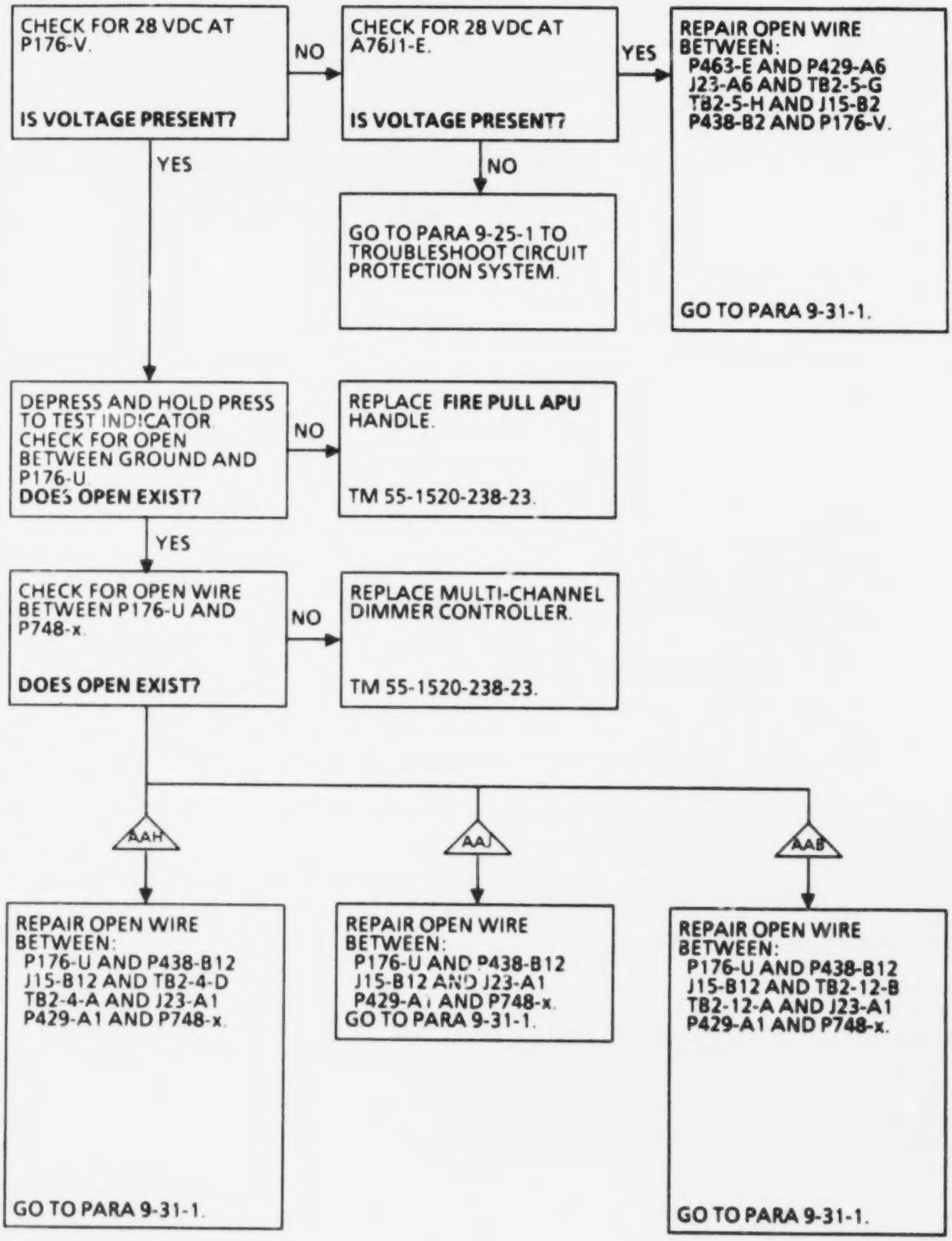
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CHECK FOR 28 VDC AT P176-V.

IS VOLTAGE PRESENT?

CHECK FOR 28 VDC AT A76J1-E.

IS VOLTAGE PRESENT?

REPAIR OPEN WIRE BETWEEN:
P463-E AND P429-A6
J23-A6 AND TB2-5-G
TB2-5-H AND J15-B2
P438-B2 AND P176-V.

GO TO PARA 9-31-1.

GO TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

DEPRESS AND HOLD PRESS TO TEST INDICATOR. CHECK FOR OPEN BETWEEN GROUND AND P176-U.
DOES OPEN EXIST?

REPLACE **FIRE PULL APU** HANDLE.

TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN P176-U AND P748-x.

DOES OPEN EXIST?

REPLACE MULTI-CHANNEL DIMMER CONTROLLER.

TM 55-1520-238-23.

REPAIR OPEN WIRE BETWEEN:
P176-U AND P438-B12
J15-B12 AND TB2-4-D
TB2-4-A AND J23-A1
P429-A1 AND P748-x.

GO TO PARA 9-31-1.

REPAIR OPEN WIRE BETWEEN:
P176-U AND P438-B12
J15-B12 AND J23-A1
P429-A1 AND P748-x.
GO TO PARA 9-31-1.

REPAIR OPEN WIRE BETWEEN:
P176-U AND P438-B12
J15-B12 AND TB2-12-B
TB2-12-A AND J23-A1
P429-A1 AND P748-x.

GO TO PARA 9-31-1.

END OF TASK

9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

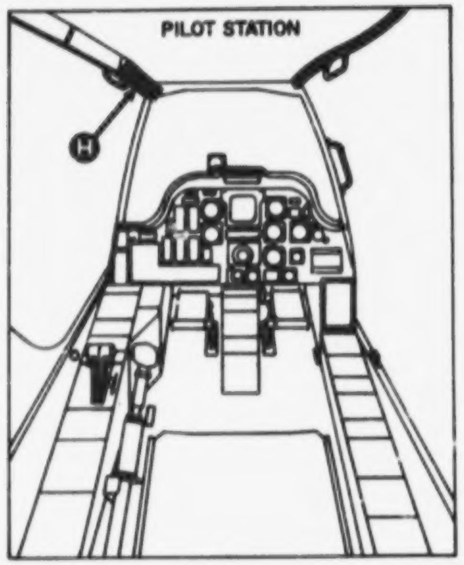
68F10 Aircraft Electrician

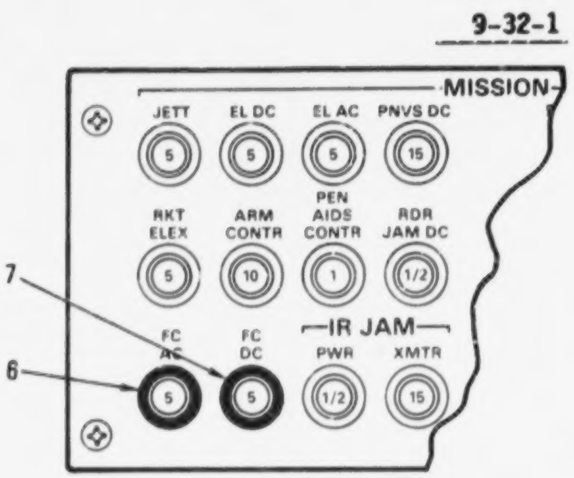
References:

TM 55-1520-238-23
TM 9-1230-476-20-2

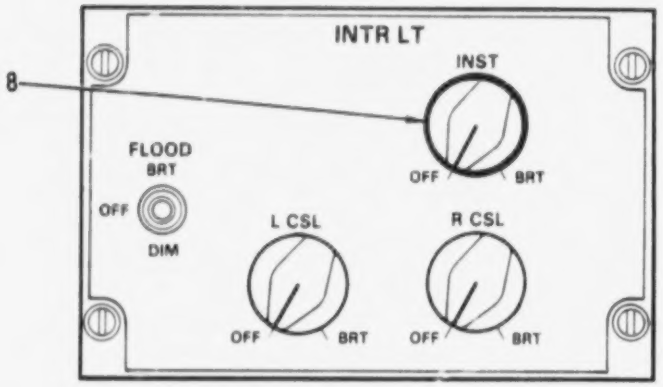
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 9-14-1	CPG EDGE-LIGHT OPERATIONAL CHECK completed

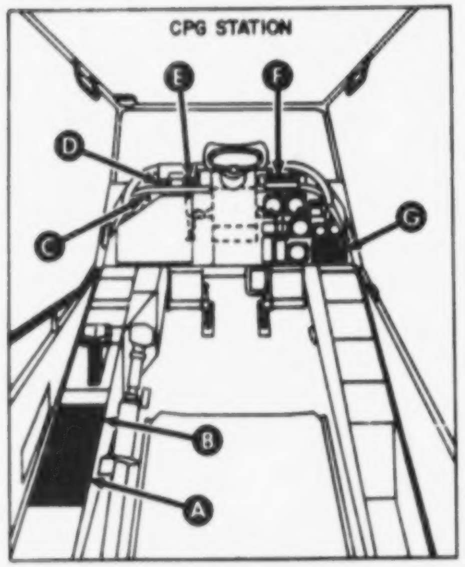


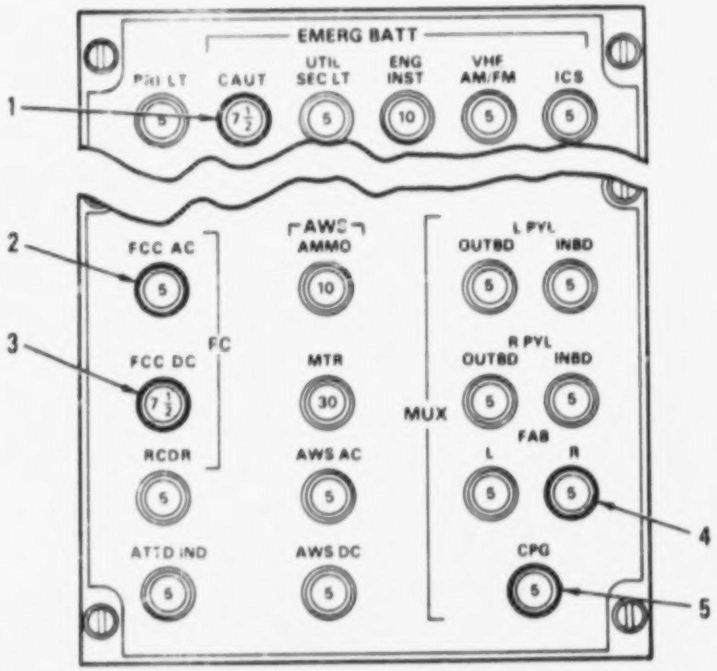


H PILOT FORWARD CIRCUIT BREAKER PANEL

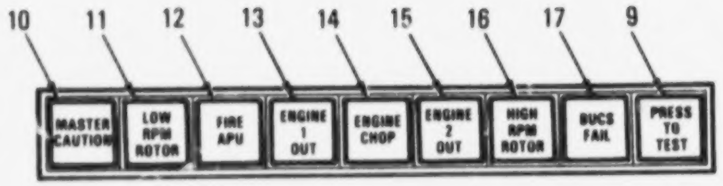


B CPG INTR LT PANEL

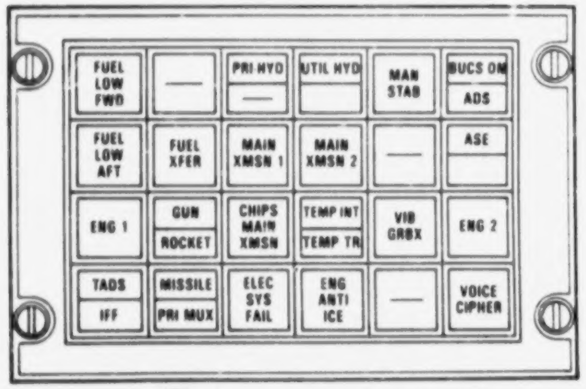




A CPG CIRCUIT BREAKER PANEL NO. 1



F CPG MASTER CAUTION/WARNING BREAKER



G CPG CAUTION/WARNING PANEL

MM04/1-1031-18

GO TO NEXT PAGE

9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

A. Perform operational check as follows:

TASK	RESULT
1. On CPG circuit breaker panel No. 1, check that **EMERG BATT CAUT** (1), **FC FCC AC** (2), **FC FCC DC** (3), **MUX FAB R** (4), and **MUX CPG** (5) circuit breakers are closed.	If **EMERG BATT CAUT** circuit breaker (1) does not stay closed, go to para 9-32-4
	If **FC FCC AC** (2), **FC FCC DC** (3), **MUX FAB R** (4) and **MUX CPG** (5) circuit breaker(s) do not stay closed, refer to TM 9-1230-476-20-2 to troubleshoot fire control system.
2. On pilot forward circuit breaker panel, check that **MISSION FC AC** (6), and **MISSION FC DC** (7) circuit breaker are closed.	If **MISSION FC AC** (6), and **MISSION FC DC** (7) circuit breaker(s) do not stay closed, refer to TM 9-1230-476-20-2 to troubleshoot fire control system.
3. On CPG **INTR LT** panel, turn **INST** control (8) to **BRT**.	If **PRESS TO TEST** (9) is not lighted, go to para 9-32-5.
	If edge-light panel is not lighted, go to para 9-32-30.
4. Turn **INST** control (8) to **OFF**.	If **CAUTION/WARNING** indicators do not increase in brightness, go to para 9-32-3.
5. On CPG master caution/warning panel, depress **PRESS TO TEST** indicator (9).	If all **MASTER CAUTION/WARNING** indicators are not lighted, go to para 9-32-6.
	If **MASTER CAUTION** indicator (10) is not lighted and flashing, go to para 9-32-7.
	If **LOW RPM ROTOR** indicator (11) is not lighted, go to para 9-32-8.
	If **FIRE APU** indicator (12) is not lighted, go to para 9-32-9.
	If **ENG 1 OUT** indicator (13) is not lighted, go to para 9-32-10.
	If **ENG CHOP** indicator (14) is not lighted, go to para 9-32-11.
	If **ENG 2 OUT** indicator (15) is not lighted, go to para 9-32-12.
	If **HIGH RPM ROTOR** indicator (16) is not lighted, go to para 9-32-13.
	If **BUCS FAIL** indicator (17) is not lighted, go to para 9-32-14.
7. On CPG cauton/warning panel, check that all indicators are lighted and flashing.	If all caution/warning indicators are not lighted and flashing, go to para 9-32-6.
	If some caution/warning indicators are not lighted and flashing, replace lamp(s) (TM 55-1520-238-23) and repeat step 6.
	If replaced lamp(s) are not lighted and flashing, replace cauton/warning panel (TM 55-1520-238-23).
8. On CPG instrument panel, check that **ARM/SAFE** (18), **FIRE PULL ENG 1** (19) and **FIRE PULL ENG 2** (20) indicators are lighted.	If all three indicators are not lighted, go to para 9-32-32.
	If **ARM/SAFE** indicator (18) is not lighted, go to para 9-32-15.
	If **FIRE PULL ENG 1** indicator (19) is not lighted, go to para 9-32-16.
	If **FIRE PULL ENG 2** indicator (20) is not lighted, go to para 9-32-17.

Ⓒ ARM/SAFE INDICATOR (18)

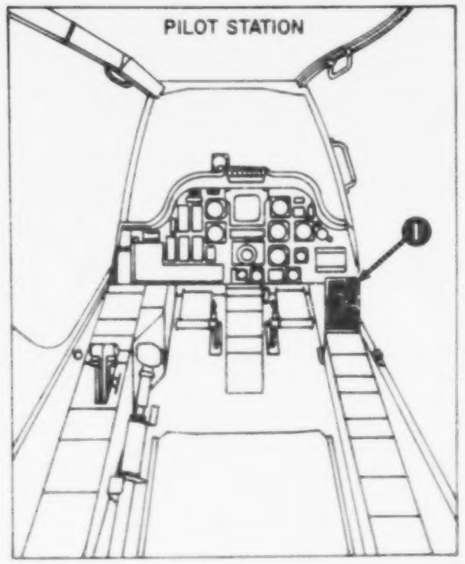
Ⓓ FIRE PULL ENG 1 INDICATOR (19)

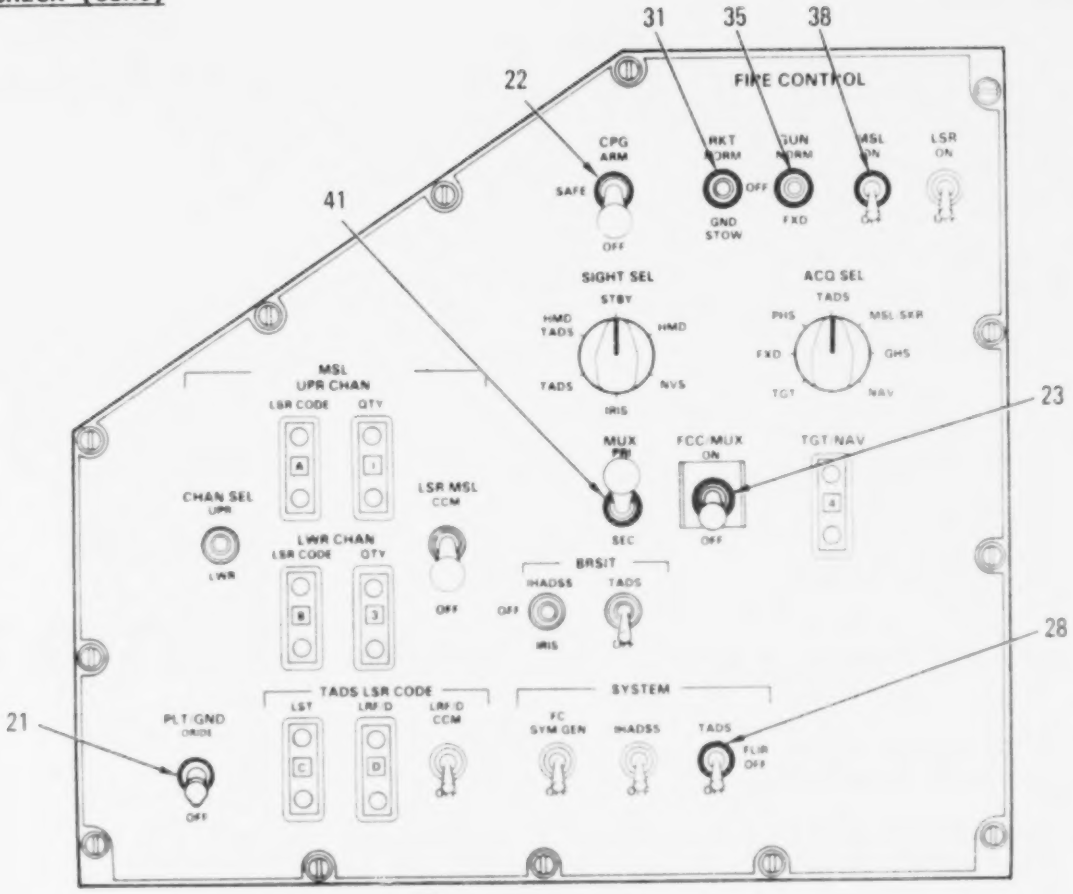
Ⓔ FIRE PULL ENG 2 INDICATOR (20)

M404/1-1031-2

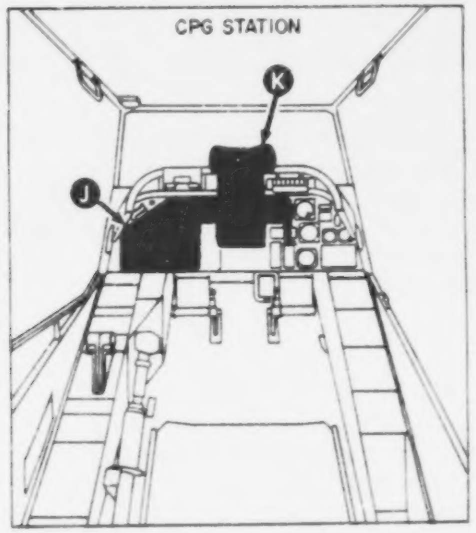
GO TO NEXT PAGE

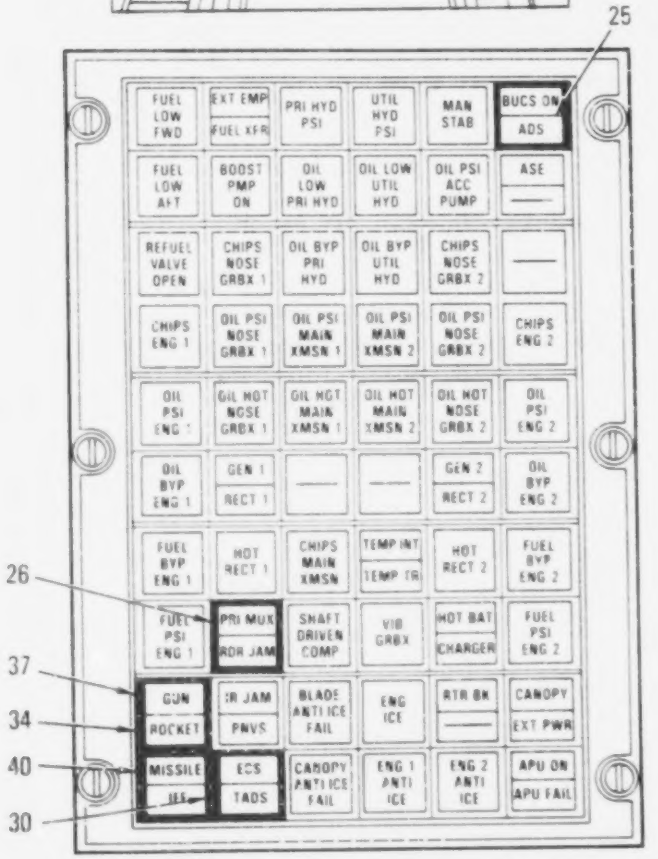
9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

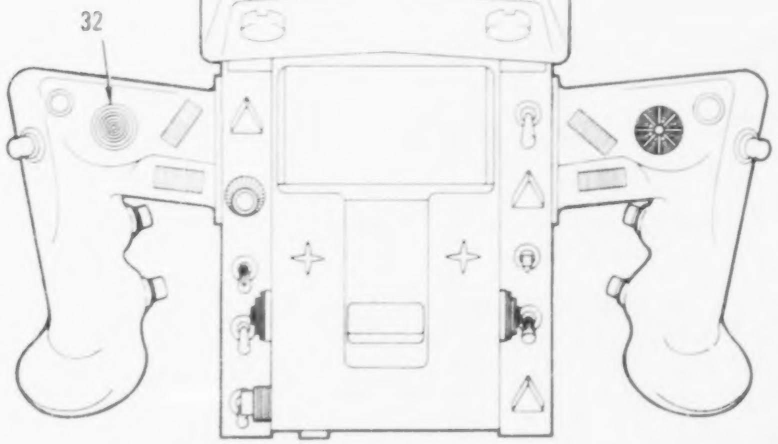




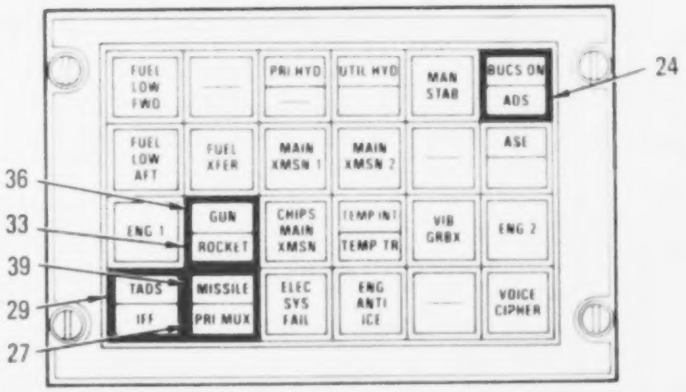
J CPG FIRE CONTROL PANEL



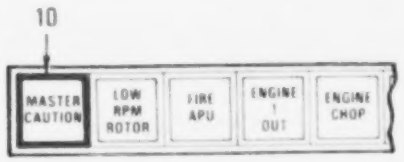




K CPG ORT



CPG CAUTION/WARNING PANEL



CPG MASTER CAUTION/WARNING PANEL

MM04/1-1031-3C

I PILOT CAUTION/WARNING PANEL

GO TO NEXT PAGE

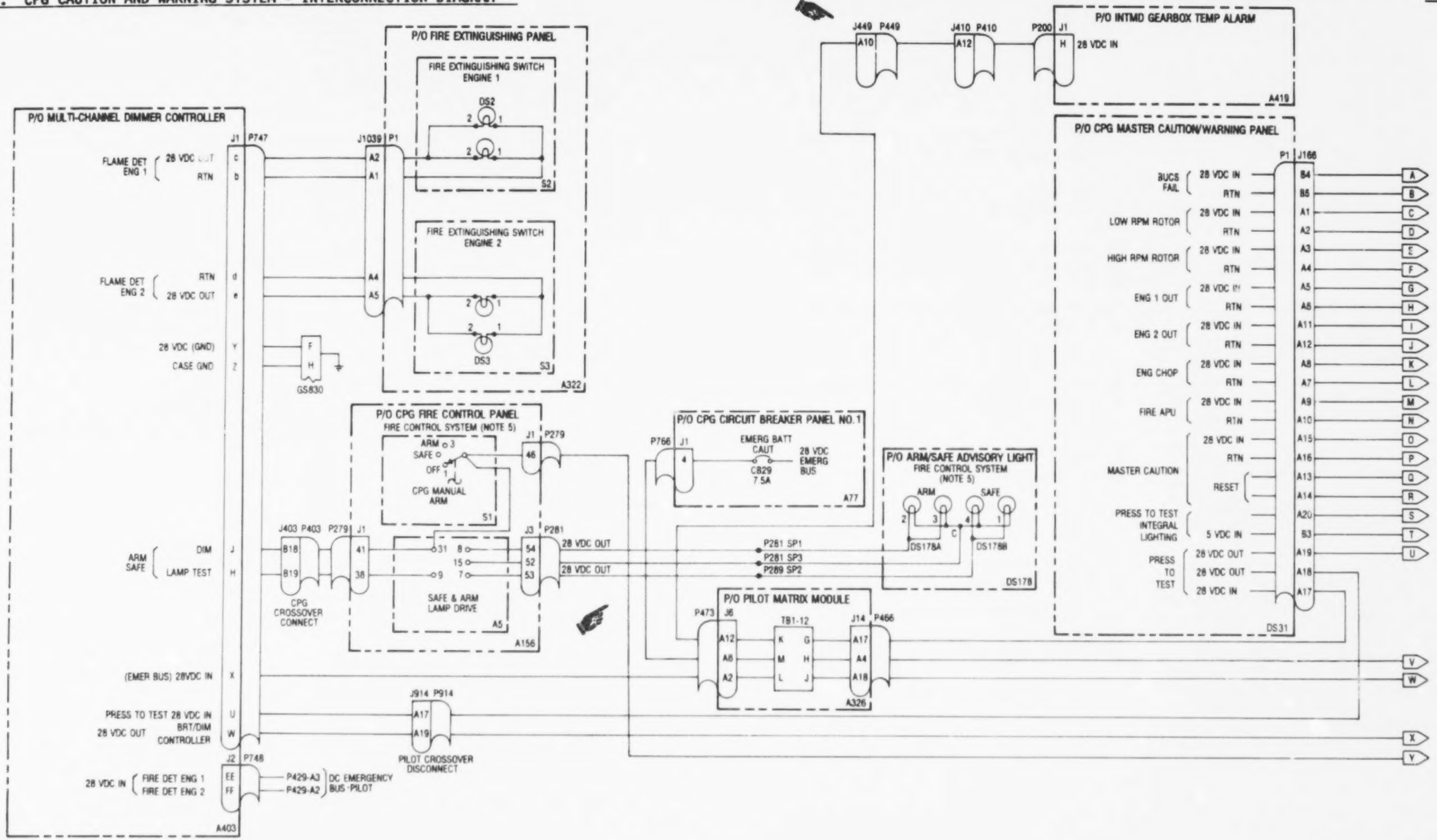
9-32-1. CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK (cont)

TASK	RESULT
9. On CPG **FIRE CONTROL** panel, set **PLT/GND ORIDE** switch (21) to **ORIDE**, **CPG ARM/SAFE** switch (22) to **ARM**, and **FCC/MUX** switch (23) to **ON**.	
10. On pilot and CPG caution/warning panels, check that **ADS** indicators (24, 25) are lighted.	If both ADS indicators (24, 25) are not lighted, go to para 9-32-18.
11. On pilot caution/warning panel, check that **PRI MUX** indicator (26) is not lighted.	If **PRI MUX** indicator (26) is lighted, go to TM 9-1230-476-20-2 to troubleshoot MRTU.
12. On CPG caution/warning panel, check that **PRI MUX** indicator (27) is not lighted.	If **PRI MUX** indicator (27) is lighted, go to TM 9-1230-476-20-2 to troubleshoot MRTU.
13. On CPG **FIRE CONTROL** panel, set **TADS** switch (28) to **TADS**. On **CPG** caution/warning panel, check that **TADS** indicator (29) is lighted.	If **TADS** indicator (29) is not lighted, go to para 9-32-19.
14. On pilot caution/warning panel, check that **TADS** indicator (30) is lighted. Return **TADS** switch (28) to **OFF**.	If **TADS** indicator (29) is not lighted, go to para 9-32-20.
15. On CPG **FIRE CONTROL** panel, set **RKT** switch (31) to **NORM**. Hold weapon action switch (32) to **RKT**. On CPG caution/warning panel, check that **ROCKET** indicator (33) is lighted.	If **ROCKET** indicator (33) is not lighted, go to para 9-32-21.
16. On pilot caution/warning panel, check that **ROCKET** indicator (34) is lighted. Return **ROCKET** switch (31) to **GND STOW**.	If **ROCKET** indicator (34) is not lighted, go to para 9-32-22.
17. On CPG **FIRE CONTROL** panel, set **GUN** switch (35) to **NORM**. Hold weapon action switch (32) to **GUN**. On **CPG** caution/warning panel, check that **GUN** indicator (36) is lighted.	If **GUN** indicator (36) is not lighted, go to para 9-32-23.
18. On pilot caution/warning panel, check that **GUN** indicator (37) is lighted. Return **GUN** switch (35) to **FXD**.	If **GUN** indicator (37) is not lighted, go to para 9-32-24.
19. On CPG **FIRE CONTROL** panel, set **MSL** switch (38) to **ON**. Hold weapon action switch (32) to **MSL**. On CPG caution/warning panel, check that **MISSILE** indicator (39) is lighted.	If **MISSILE** indicator (39) is not lighted, go to para 9-32-25.
20. On pilot caution/warning panel, check that **MISSILE** indicator (40) is lighted. Return **MSL** switch to **OFF**.	If **MISSILE** indicator (40) is not lighted, go to para 9-32-26.
21. On CPG **FIRE CONTROL** panel, set **FCC/MUX** switch (23) to **OFF**, CPG **ARM** switch (22) to **OFF**, and **PLT/GND ORIDE** switch (21) to **OFF**.	
22. On CPG Circuit breaker panel no. 1, open **FC FCC AC** (2) and **FC FCC DC** (3) circuit breakers. On CPG **FIRE CONTROL** panel, set **MUX** switch (41) to **SEC**. On CPG caution/warning panel, check that **PRI MUX** indicator (27) is lighted and flashing.	If **PRI MUX** indicator (27) is not lighted and flashing, go to para 9-32-27.
23. On CPG master caution/warning panel, depress **MASTER CAUTION** indicator (10). Check that **MASTER CAUTION** indicator (10) is not lighted.	If **MASTER CAUTION** (10) is lighted, go to para 9-32-28.
24. On CPG caution/warning panel, check that **PRI MUX** indicator (27) is lighted and not flashing.	If **PRI MUX** indicator (27) is not lighted, or is flashing, go to para 9-32-28.
25. On pilot caution/warning panel, check that **PRI MUX** indicator (26) is lighted and not flashing.	If **PRI MUX** indicator (26) is not lighted and flashing, go to para 9-32-29.

B. Perform EXTERNAL POWER - POWER DOWN procedure (para 9-5-3).

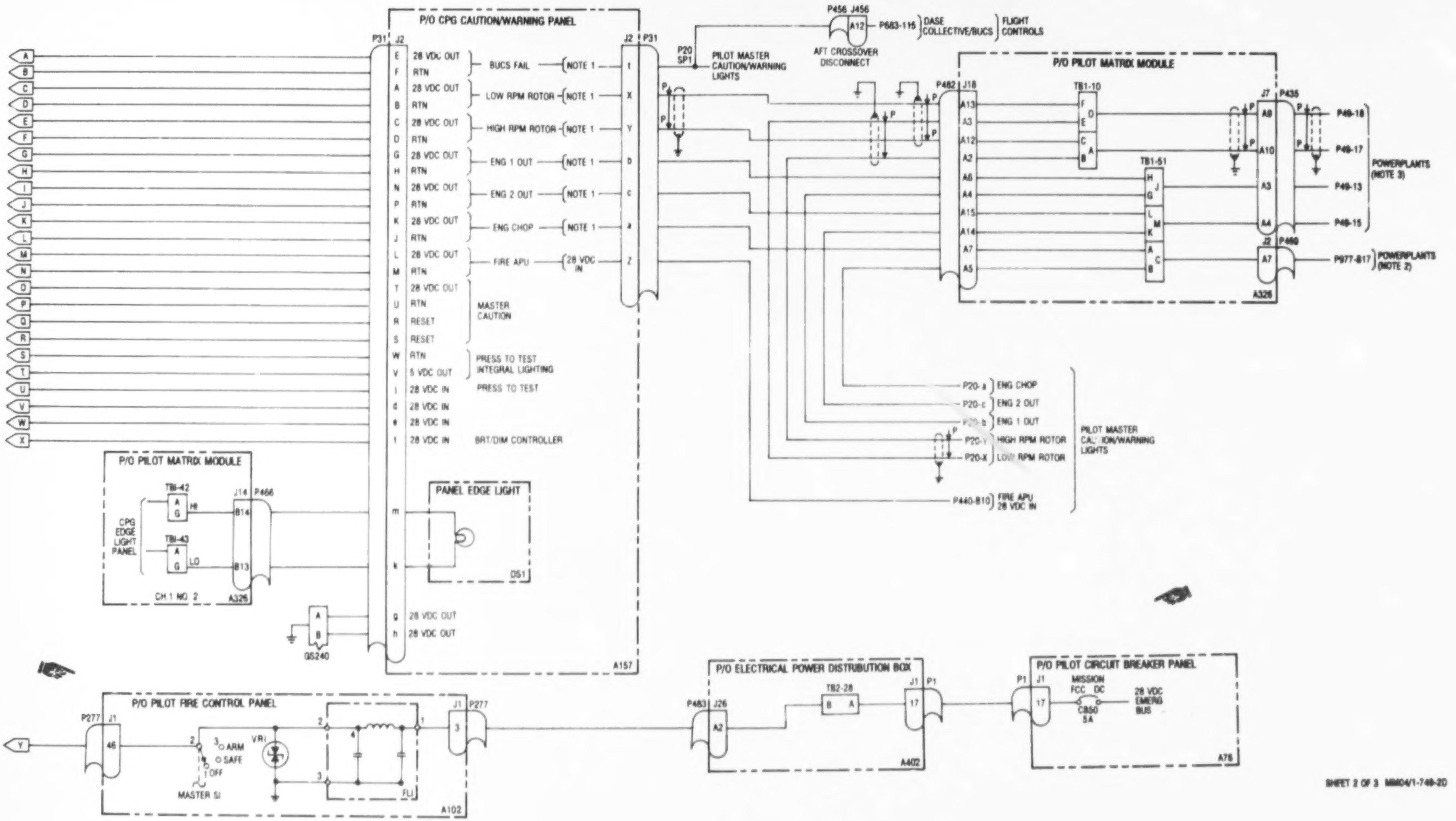
END OF TASK

9-32-2. CPG CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM



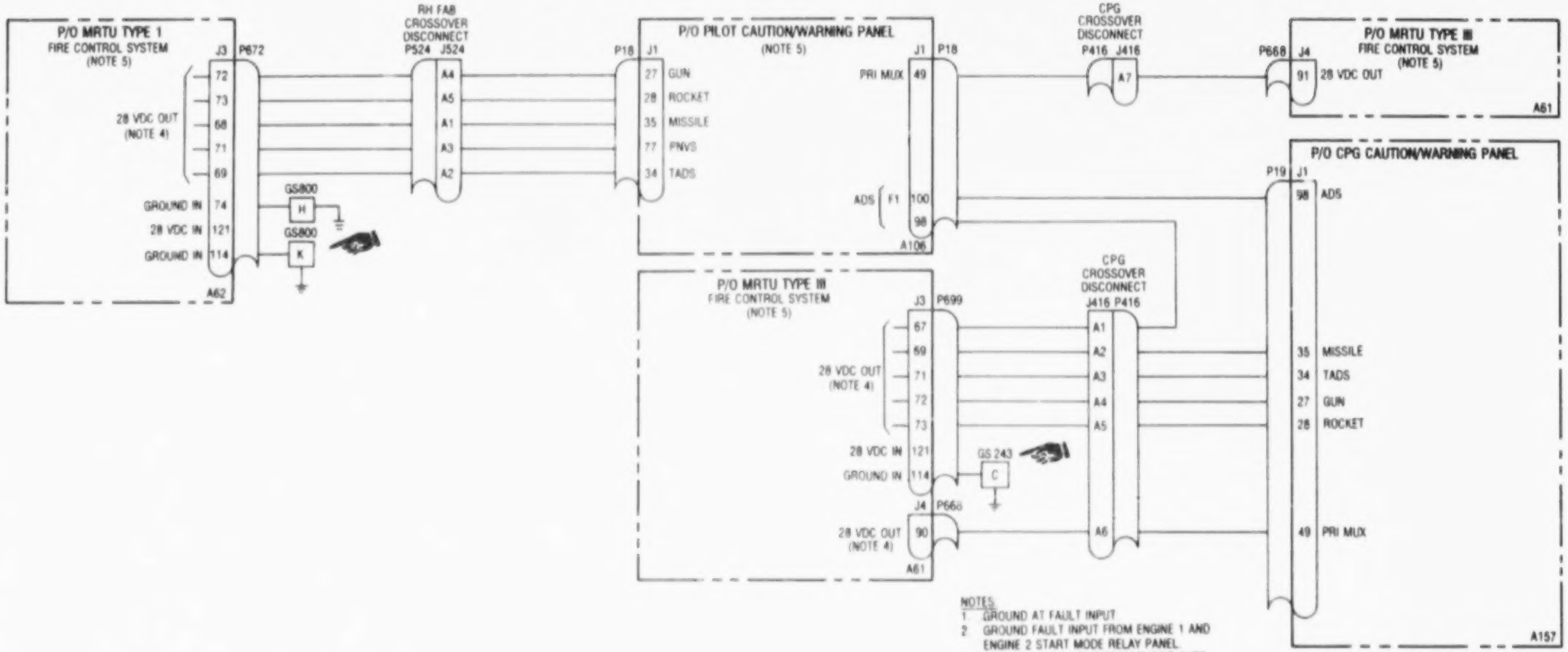
SHEET 1 OF 3 MM04/1-749-1E

9-32-2. CPG CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)



SHEET 2 OF 3 MM04/1-749-2D

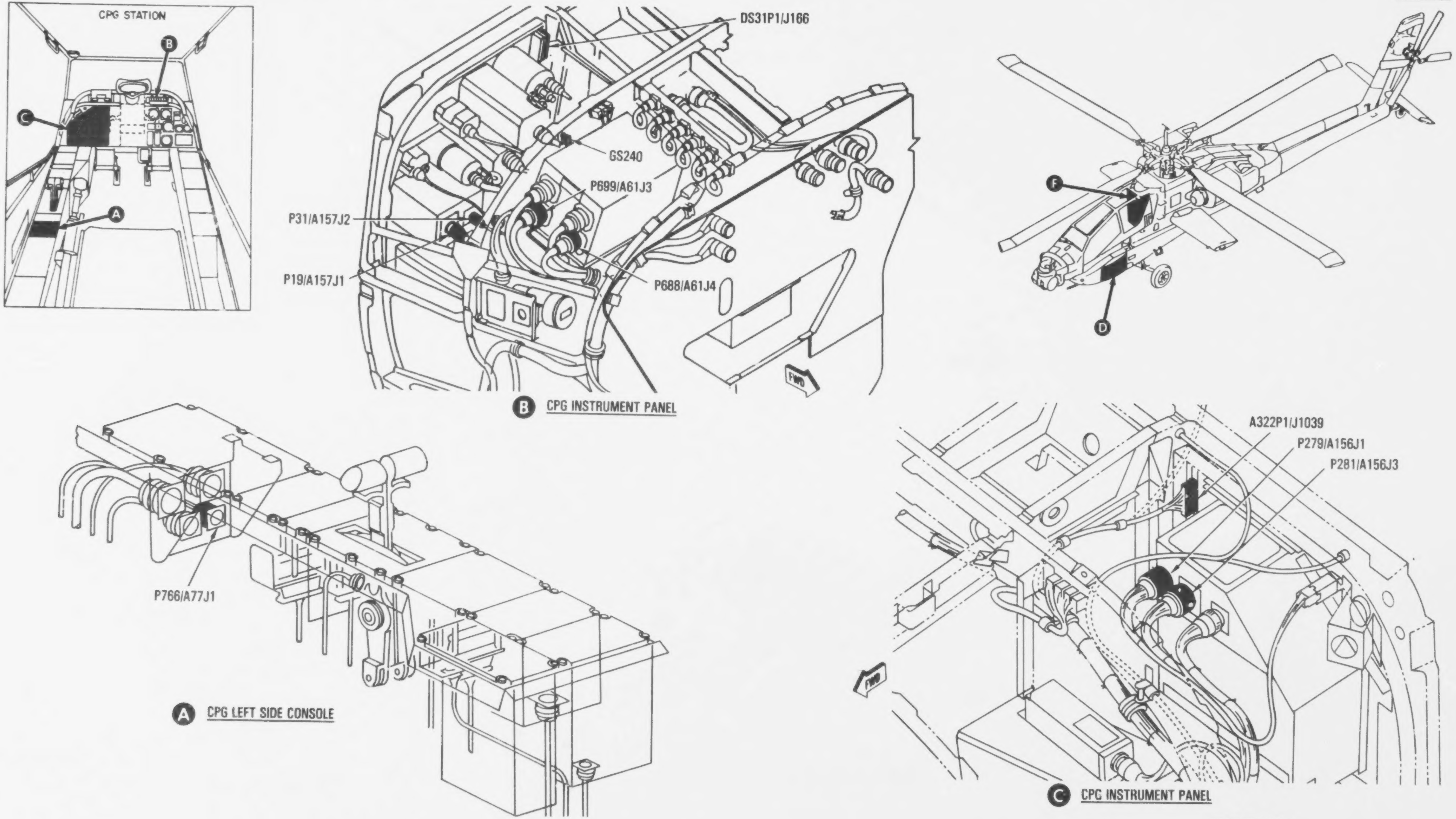
9-32-2. CPG CAUTION AND WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)



NOTES
1 GROUND AT FAULT INPUT
2 GROUND FAULT INPUT FROM ENGINE 1 AND ENGINE 2 START MODE RELAY PANEL
3 GROUND FAULT INPUT FROM ENGINE OUT? WARNING UNIT
4 AT FAILURE
5 REFER TO CHAPTER 1 FOR SEPARATE TECHNICAL MANUAL

SHEET 3 OF 3 MM04/1-749-3G

9-32-3. CPG CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



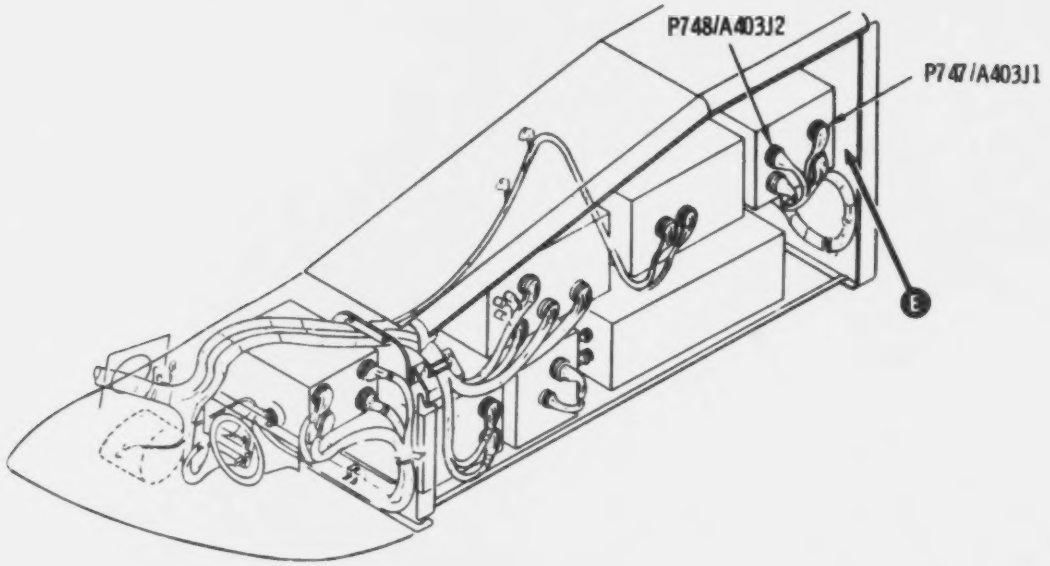
B CPG INSTRUMENT PANEL

A CPG LEFT SIDE CONSOLE

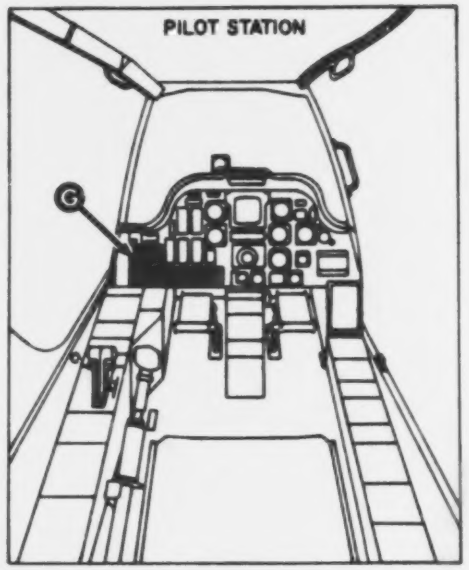
C CPG INSTRUMENT PANEL

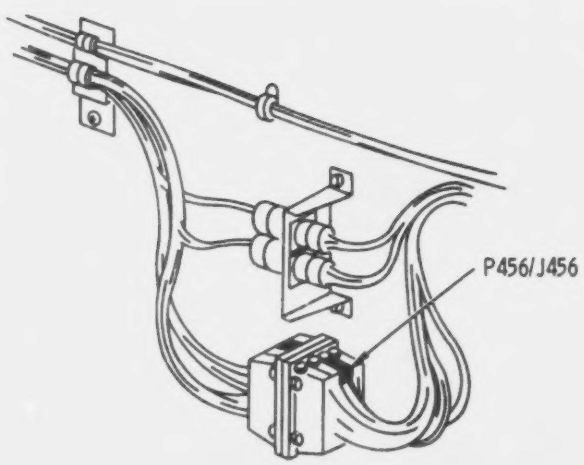
MM04/1-1173-1

9-32-3. CPG CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

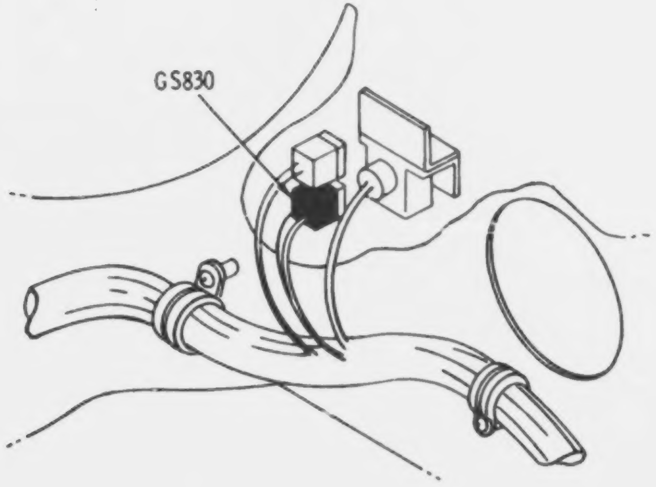


D LEFT HAND FORWARD AVIONICS BAY

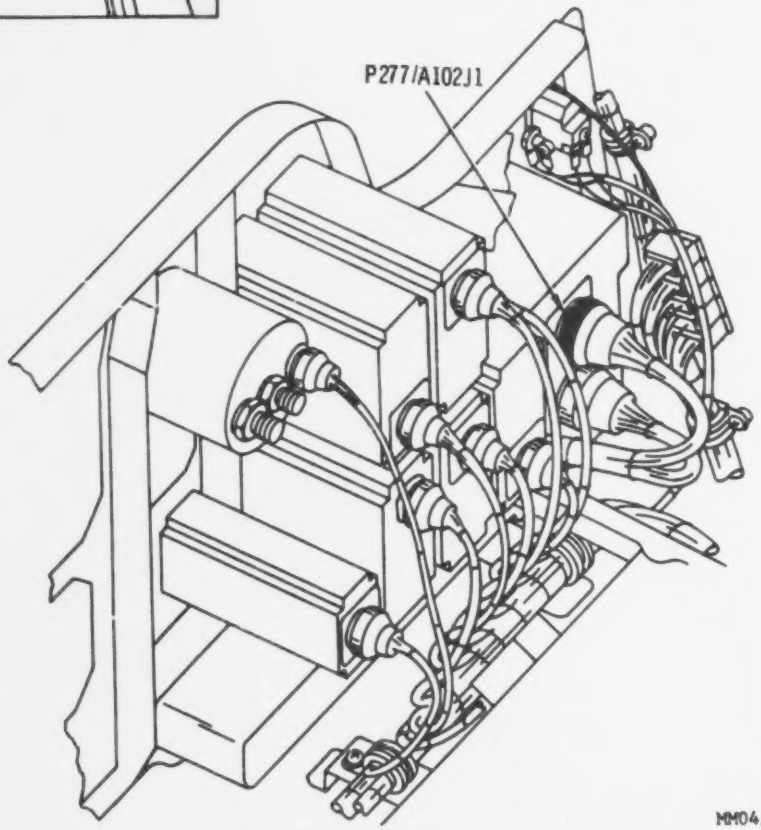




F PILOT STATION REAR BULKHEAD



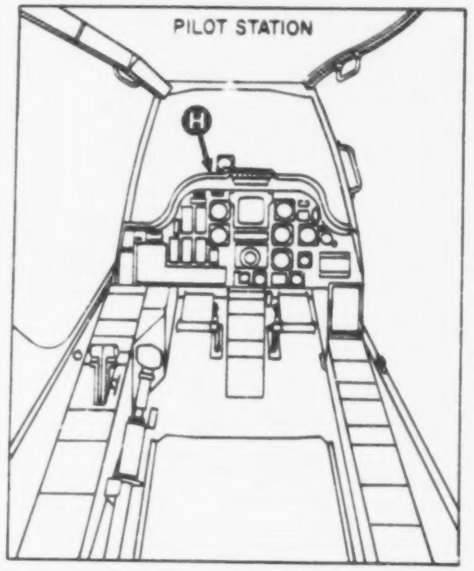
E REAR WALL OF LEFT HAND FORWARD AVIONICS BAY

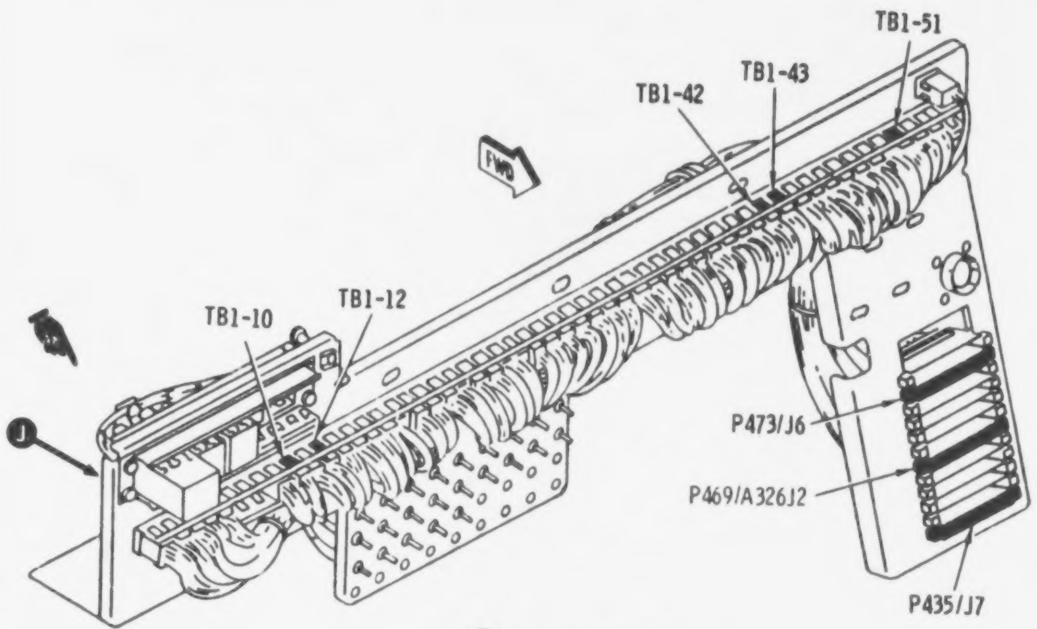


MM04/1-1173-2B

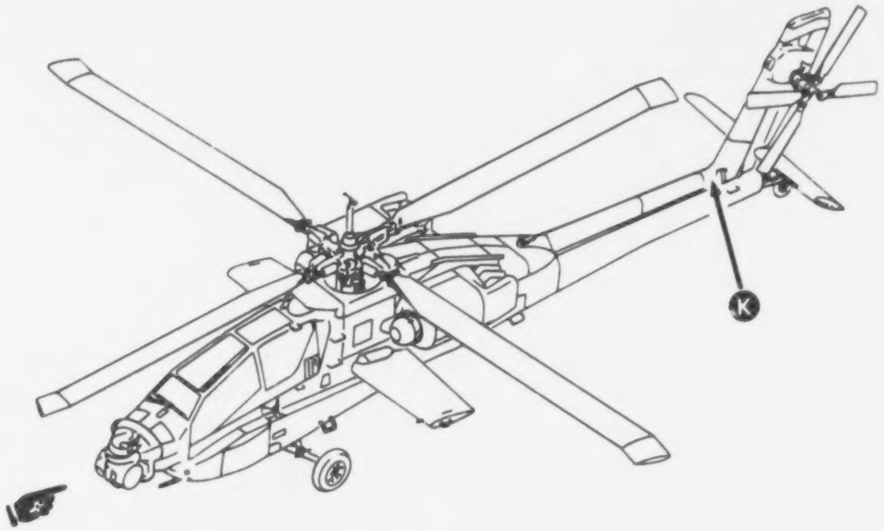
G PILOT INSTRUMENT PANEL (AFT VIEW)

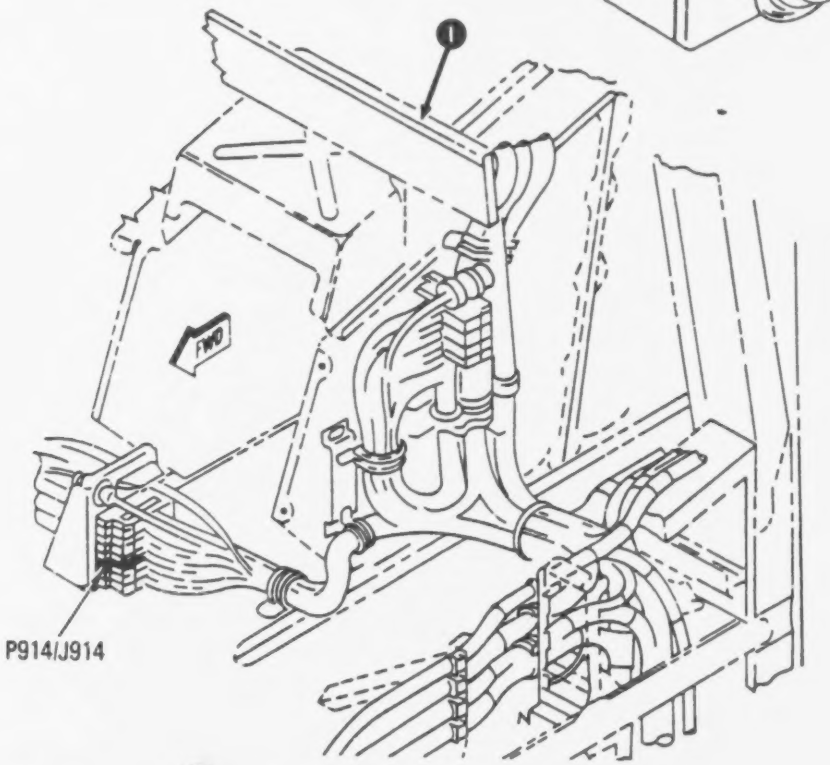
9-32-3. CPG CAUTION WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION



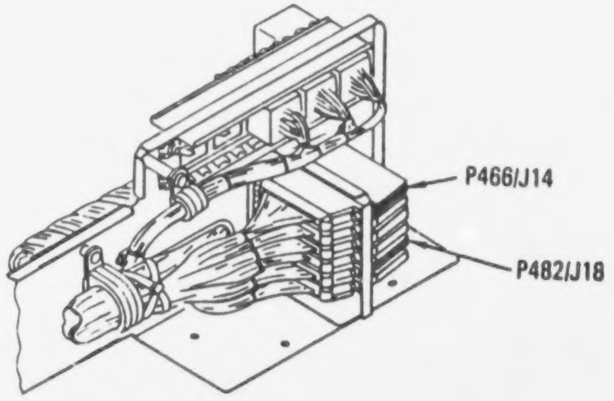


Ⓘ PILOT MATRIX MODULE

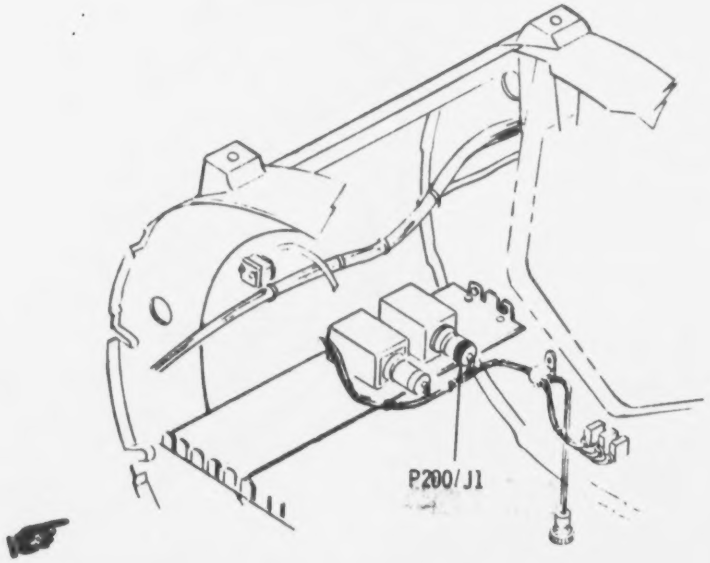




Ⓗ PILOT INSTRUMENT PANEL



Ⓙ PILOT MATRIX MODULE (ROTATED)

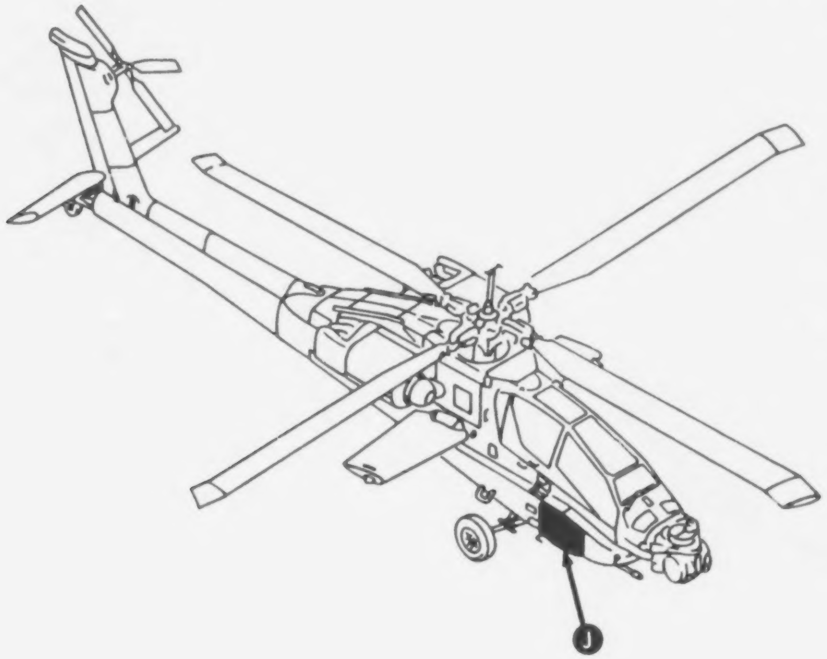


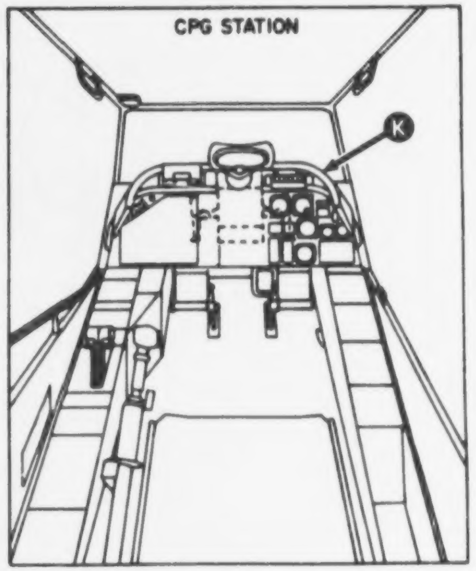
Ⓚ TAILBOOM THROUGH COVERS L545, R545

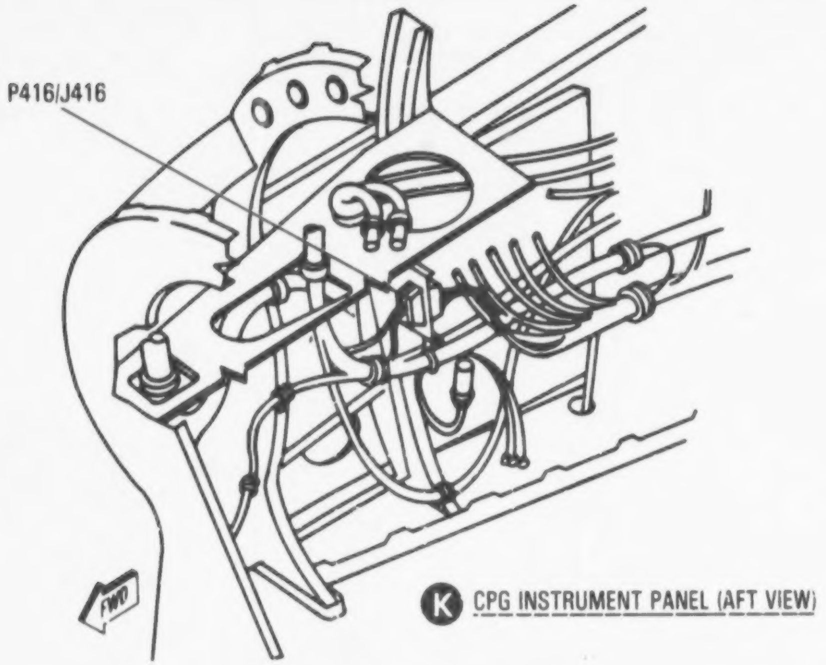
MM04/1-1173-3C

END OF TASK

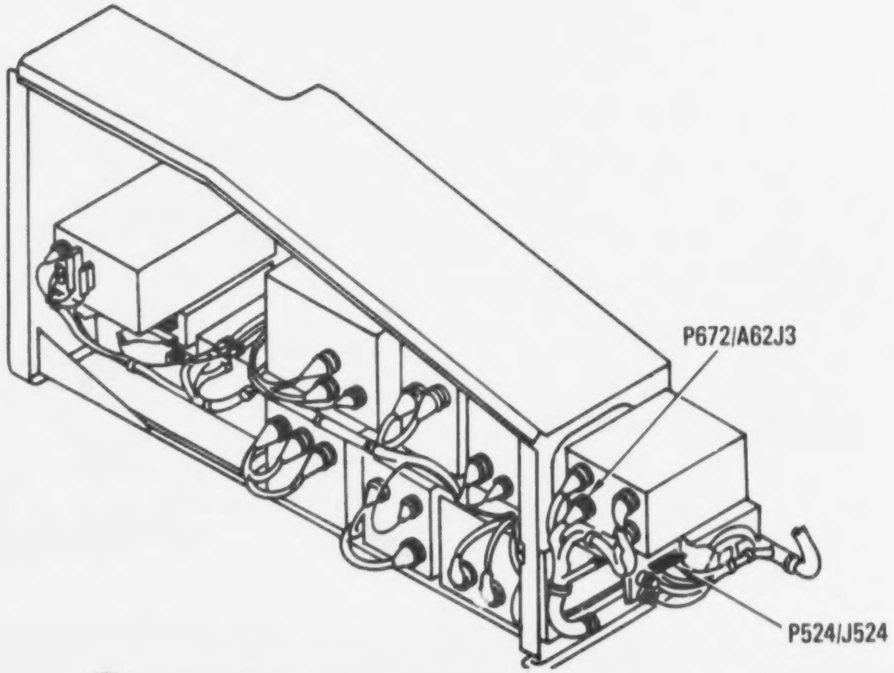
9-32-3. CPG CAUTION AND WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



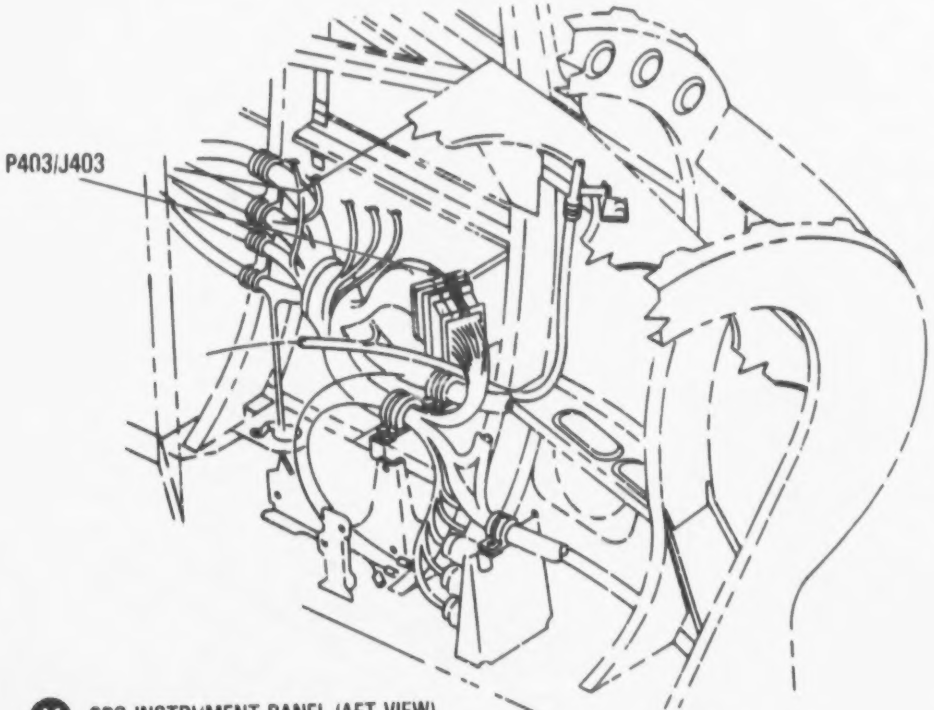




K CPG INSTRUMENT PANEL (AFT VIEW)



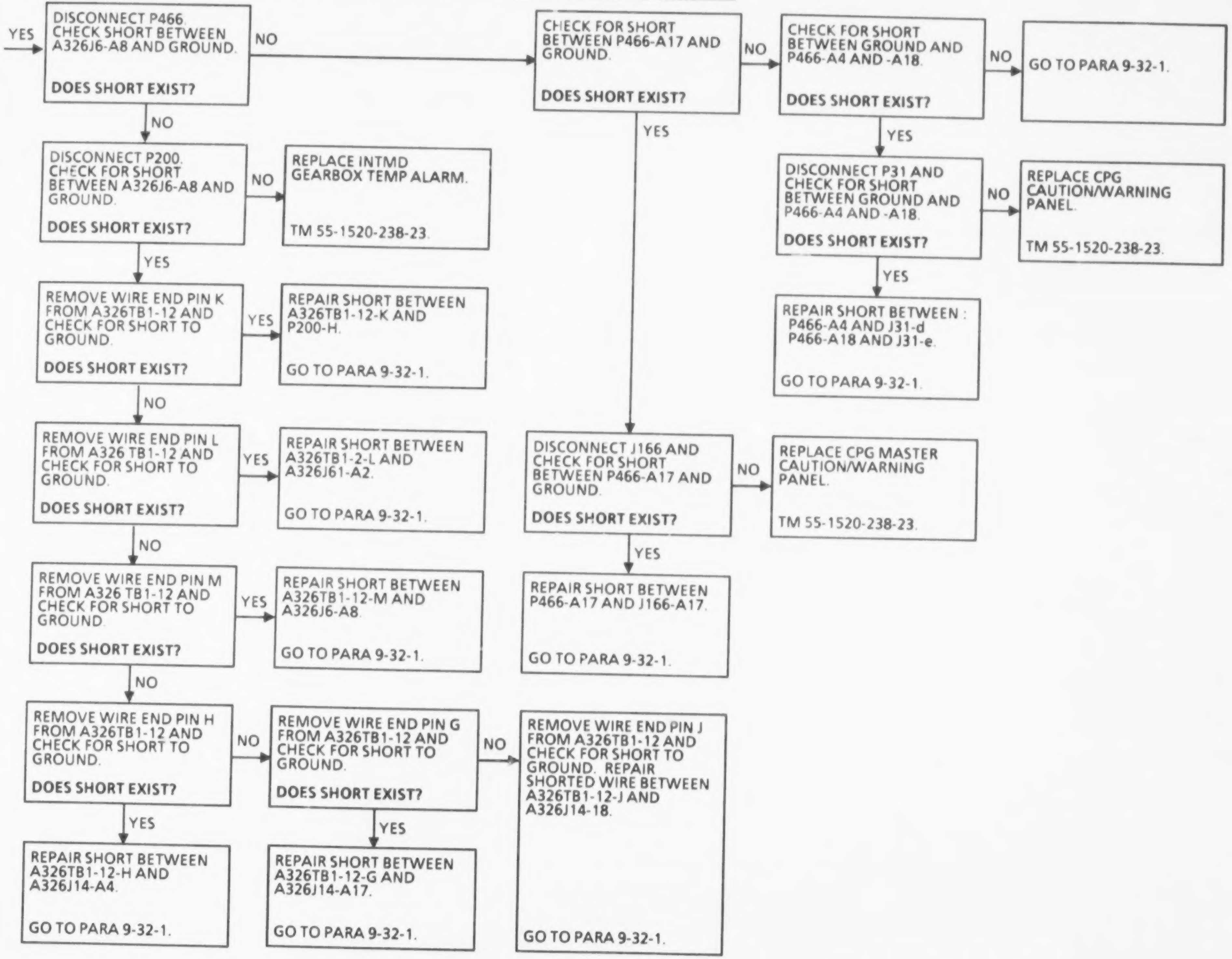
J RIGHT HAND FORWARD AVIONICS BAY



K CPG INSTRUMENT PANEL (AFT VIEW)

MM04/1-1173-4B

9-32-4. EMERG BATT CAUT CIRCUIT BREAKER (CB29) - DOES NOT STAY CLOSED (cont)


YES
DISCONNECT P466. CHECK SHORT BETWEEN A326J6-A8 AND GROUND. DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN P466-A17 AND GROUND. DOES SHORT EXIST?
NO
CHECK FOR SHORT BETWEEN GROUND AND P466-A4 AND -A18. DOES SHORT EXIST?
NO
GO TO PARA 9-32-1.
YES
DISCONNECT P31 AND CHECK FOR SHORT BETWEEN GROUND AND P466-A4 AND -A18. DOES SHORT EXIST?
NO
REPLACE CPG CAUTION/WARNING PANEL. TM 55-1520-238-23.
YES
REPAIR SHORT BETWEEN : P466-A4 AND J31-d P466-A18 AND J31-e. GO TO PARA 9-32-1.
YES
DISCONNECT J166 AND CHECK FOR SHORT BETWEEN P466-A17 AND GROUND. DOES SHORT EXIST?
NO
REPLACE CPG MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.
YES
REPAIR SHORT BETWEEN P466-A17 AND J166-A17. GO TO PARA 9-32-1.
NO
DISCONNECT P200. CHECK FOR SHORT BETWEEN A326J6-A8 AND GROUND. DOES SHORT EXIST?
NO
REPLACE INTMD GEARBOX TEMP ALARM. TM 55-1520-238-23.
YES
REMOVE WIRE END PIN K FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-K AND P200-H. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN L FROM A326 TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-2-L AND A326J61-A2. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN M FROM A326 TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-M AND A326J6-A8. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN H FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-H AND A326J14-A4. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN G FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. DOES SHORT EXIST?
YES
REPAIR SHORT BETWEEN A326TB1-12-G AND A326J14-A17. GO TO PARA 9-32-1.
NO
REMOVE WIRE END PIN J FROM A326TB1-12 AND CHECK FOR SHORT TO GROUND. REPAIR SHORTED WIRE BETWEEN A326TB1-12-J AND A326J14-18. GO TO PARA 9-32-1.

END OF TASK

9-32-5. PRESS TO TEST INDICATOR - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-139-2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

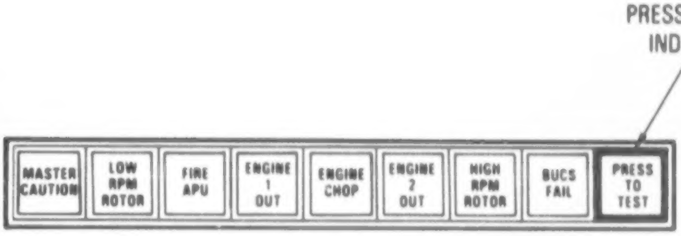
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed External power application - Electrical

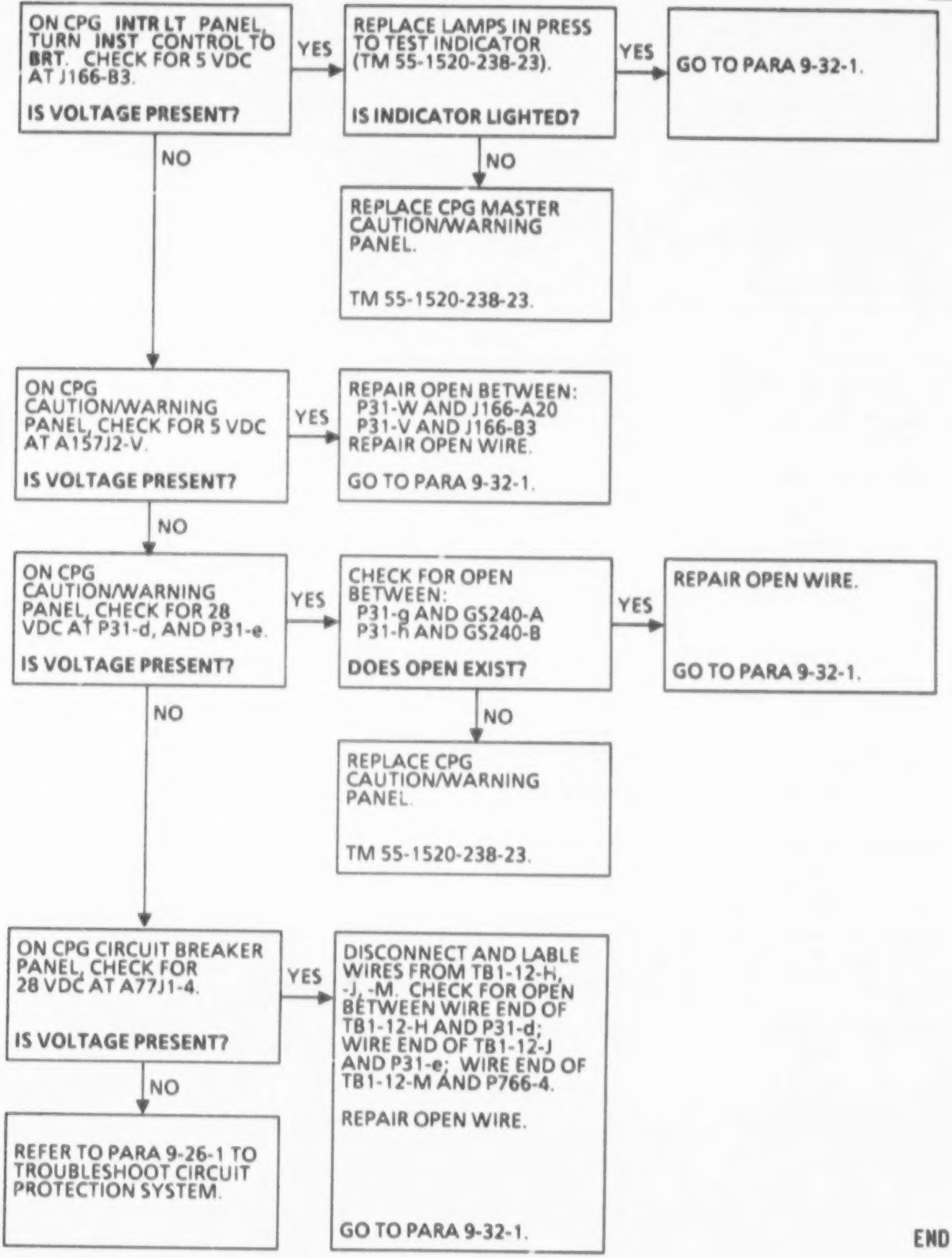
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG MASTER CAUTION/WARNING PANEL

MM04/1-1205



ON CPG INTR LT PANEL, TURN INST CONTROL TO BRT. CHECK FOR 5 VDC AT J166-B3.

IS VOLTAGE PRESENT?

REPLACE LAMPS IN PRESS TO TEST INDICATOR (TM 55-1520-238-23).

IS INDICATOR LIGHTED?

GO TO PARA 9-32-1.

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

ON CPG CAUTION/WARNING PANEL, CHECK FOR 5 VDC AT A157J2-V.

IS VOLTAGE PRESENT?

REPAIR OPEN BETWEEN:
P31-W AND J166-A20
P31-V AND J166-B3
REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P31-d, AND P31-e.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P31-g AND GS240-A
P31-h AND GS240-B

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

ON CPG CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A77J1-4.

IS VOLTAGE PRESENT?

DISCONNECT AND LABLE WIRES FROM TB1-12-H, -J, -M. CHECK FOR OPEN BETWEEN WIRE END OF TB1-12-H AND P31-d; WIRE END OF TB1-12-J AND P31-e; WIRE END OF TB1-12-M AND P766-4.

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REFER TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

END OF TASK

9-32-6. ALL CAUTION/WARNING MASTER CAUTION AND INDICATORS - DO NOT LIGHT WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-5)

Personnel Required: (para 9-32-5)

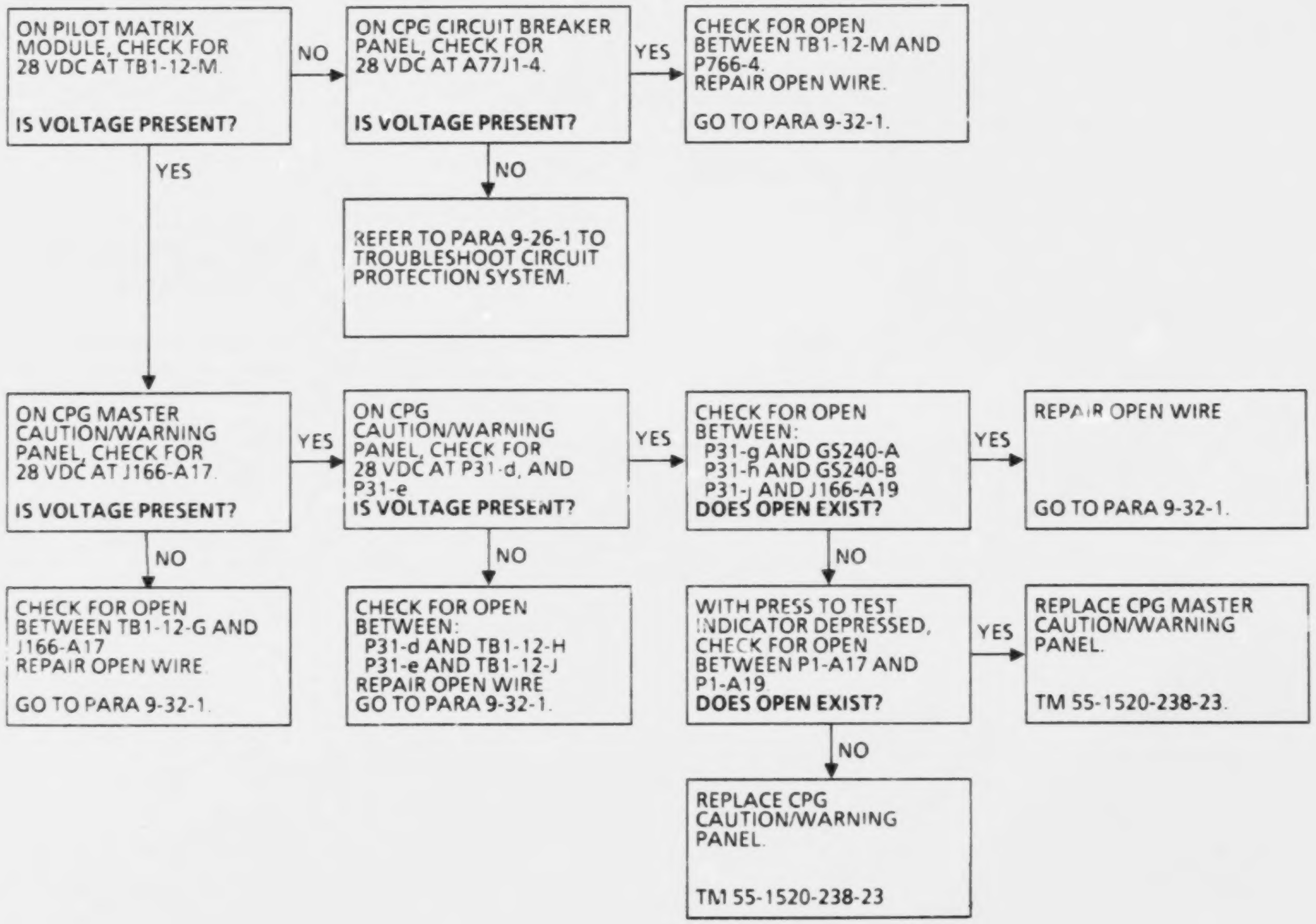
References: (para 9-32-5)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Non-transparent barrier removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON PILOT MATRIX MODULE, CHECK FOR 28 VDC AT TB1-12-M.
IS VOLTAGE PRESENT?
NO
ON CPG CIRCUIT BREAKER PANEL, CHECK FOR 28 VDC AT A77J1-4.
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN TB1-12-M AND P766-4.
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
REFER TO PARA 9-26-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
ON CPG MASTER CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT J166-A17.
IS VOLTAGE PRESENT?
YES
ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT P31-d, AND P31-e
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN:
P31-g AND GS240-A
P31-h AND GS240-B
P31-j AND J166-A19
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE
GO TO PARA 9-32-1.
NO
CHECK FOR OPEN BETWEEN TB1-12-G AND J166-A17
REPAIR OPEN WIRE.
GO TO PARA 9-32-1.
NO
CHECK FOR OPEN BETWEEN:
P31-d AND TB1-12-H
P31-e AND TB1-12-J
REPAIR OPEN WIRE
GO TO PARA 9-32-1.
NO
WITH PRESS TO TEST INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN P1-A17 AND P1-A19
DOES OPEN EXIST?
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23

END OF TASK

best copy available

Reproduced from poor document.

9-32-7. MASTER CAUTION INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

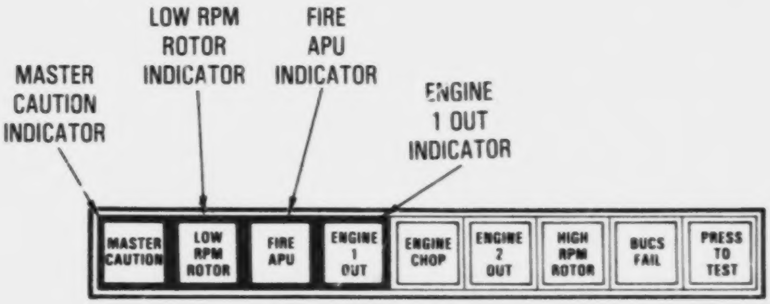
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

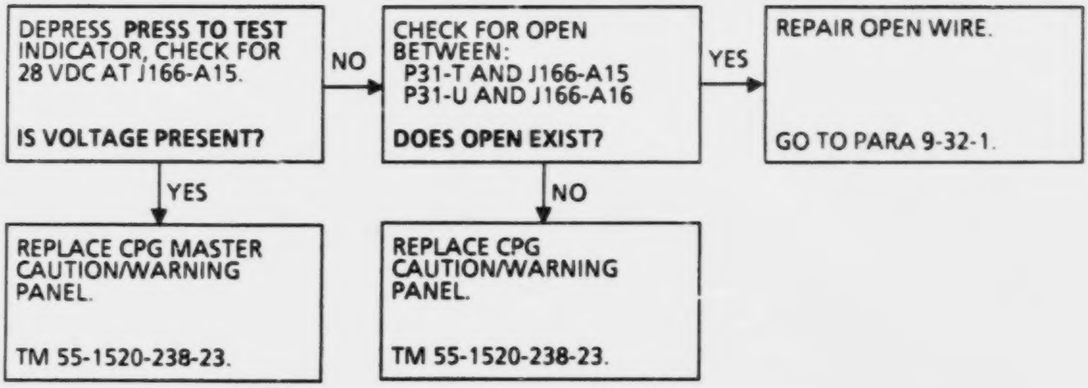
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG MASTER CAUTION/WARNING PANEL

MM04/1-1206


DEPRESS **PRESS TO TEST** INDICATOR, CHECK FOR 28 VDC AT J166-A15.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P31-T AND J166-A15
P31-U AND J166-A16

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TASK

9-32-8. LOW RPM ROTOR INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-7)

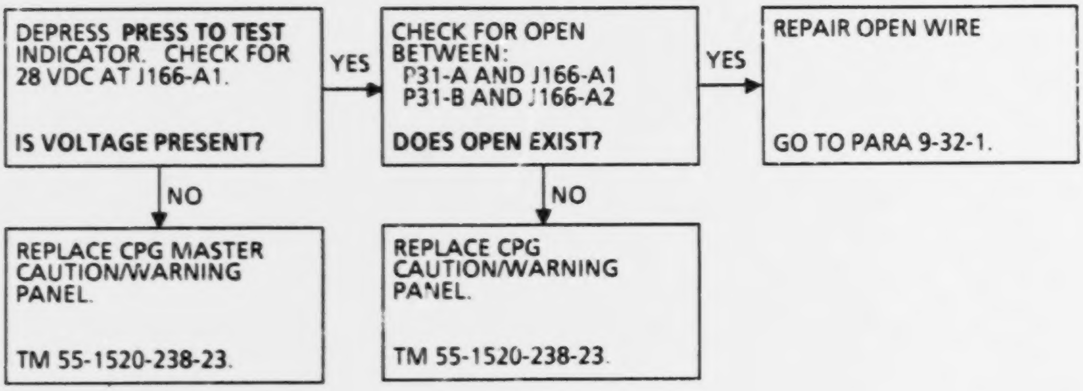
Personnel Required: (para 9-32-7)

References: (para 9-32-7)

Equipment Conditions: (para 9-32-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-32-9. FIRE APU INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-7)

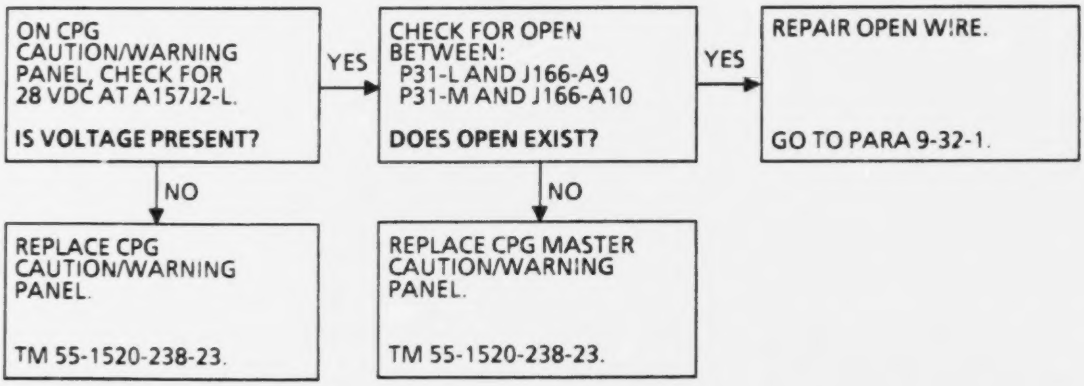
Personnel Required: (para 9-32-7)

References: (para 9-32-7)

Equipment Conditions: (para 9-32-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-32-10. ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-7)

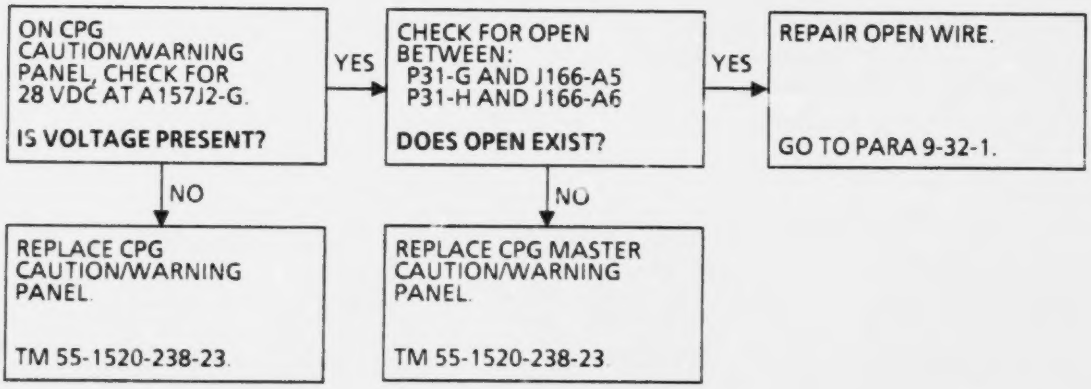
Personnel Required: (para 9-32-7)

References: (para 9-32-7)

Equipment Conditions: (para 9-32-7)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-G.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P31-G AND J166-A5
P31-H AND J166-A6

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TASK

9-32-11. ENGINE CHOP INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

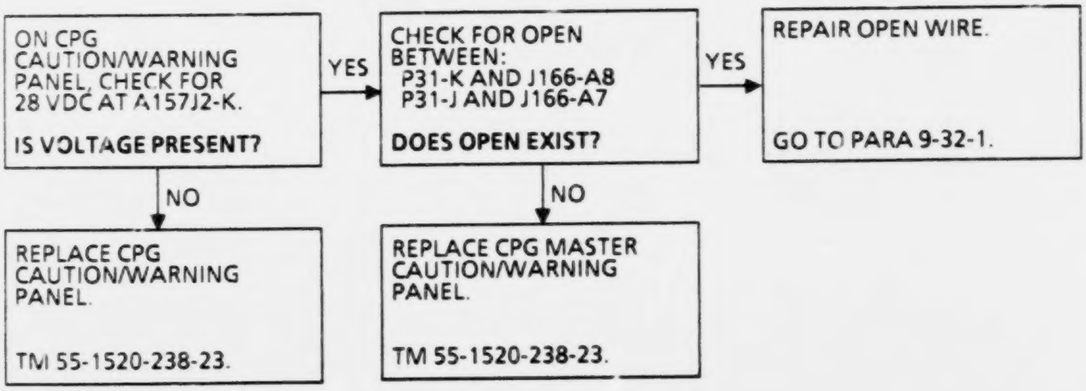
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP - completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-32-12. ENGINE 2 OUT INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-11)

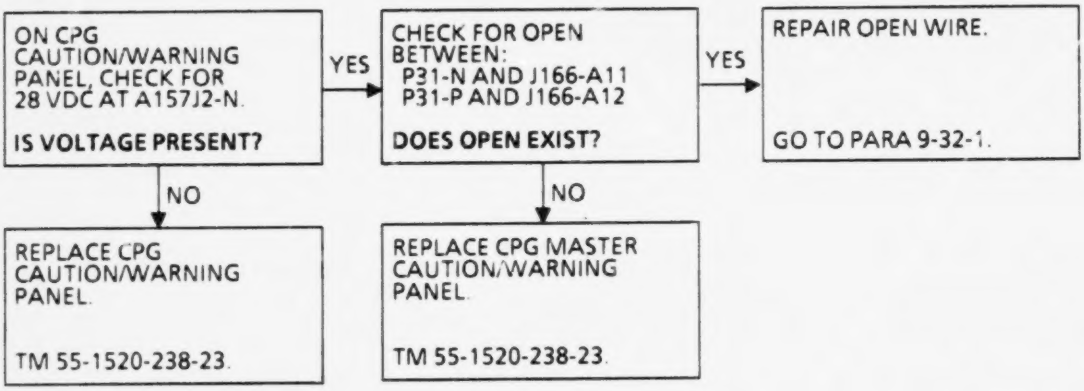
Personnel Required: (para 9-32-11)

References: (para 9-32-11)

Equipment Conditions: (para 9-32-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-N.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P31-N AND J166-A11
P31-P AND J166-A12

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TAS

9-32-13. HIGH RPM ROTOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-11)

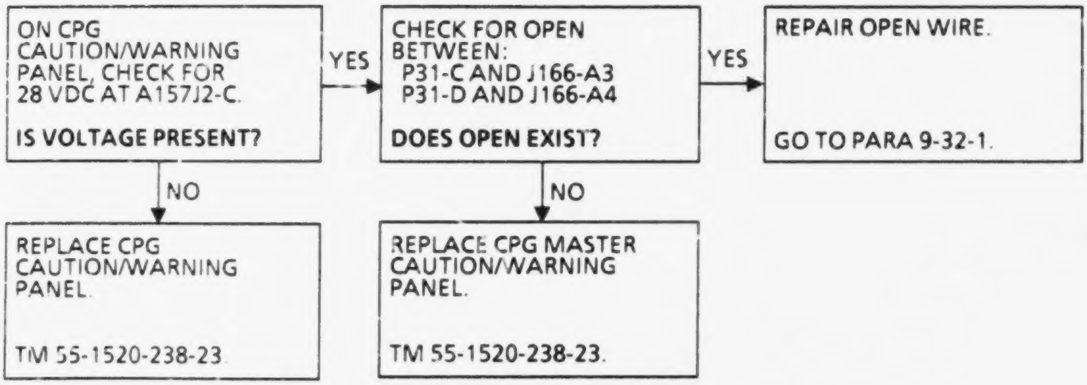
Personnel Required: (para 9-32-11)

References: (para 9-32-11)

Equipment Conditions: (para 9-32-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-32-14. BUCS FAIL INDICATOR - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-11)

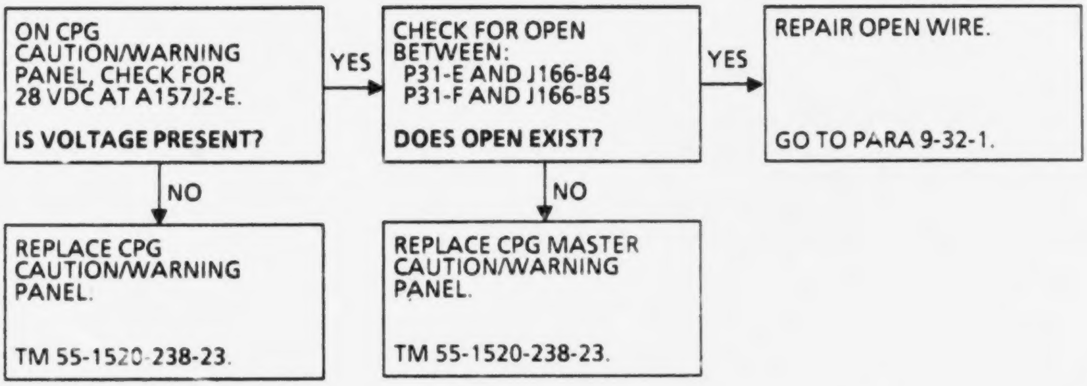
Personnel Required: (para 9-32-11)

References: (para 9-32-11)

Equipment Conditions: (para 9-32-11)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG CAUTION/WARNING PANEL, CHECK FOR 28 VDC AT A157J2-E.

IS VOLTAGE PRESENT?

CHECK FOR OPEN BETWEEN:
P31-E AND J166-B4
P31-F AND J166-B5

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

END OF TASK

9-32-15. ARM/SAFE ADVISORY LIGHT - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician

References:

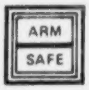
TM 55-1520-238-23
TM 9-1230-476-20-1

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L40 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

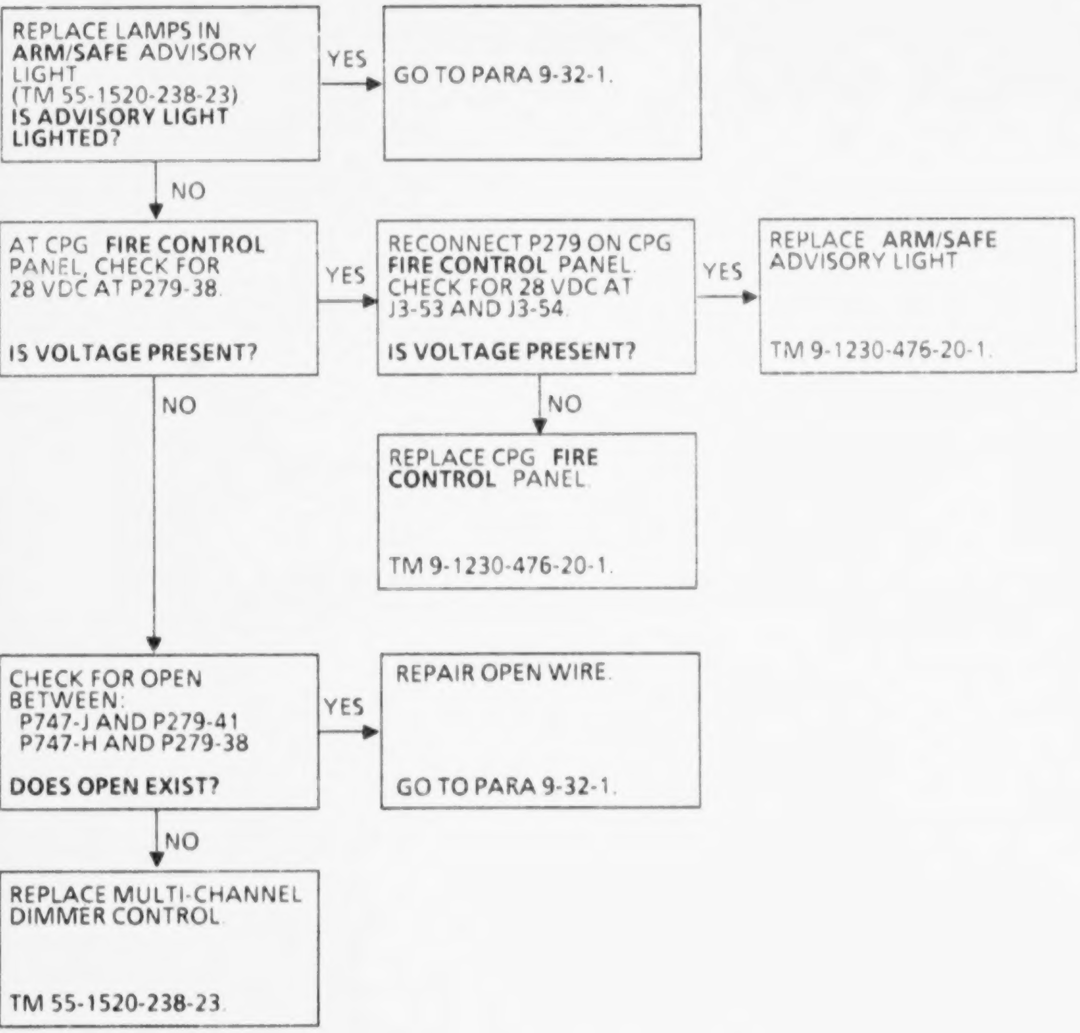
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ARM/SAFE ADVISORY LIGHT

MM04/1-1208



REPLACE LAMPS IN **ARM/SAFE** ADVISORY LIGHT (TM 55-1520-238-23) **IS ADVISORY LIGHT LIGHTED?**

GO TO PARA 9-32-1.

AT CPG **FIRE CONTROL** PANEL, CHECK FOR 28 VDC AT P279-38.

IS VOLTAGE PRESENT?

RECONNECT P279 ON CPG **FIRE CONTROL** PANEL. CHECK FOR 28 VDC AT J3-53 AND J3-54.

IS VOLTAGE PRESENT?

REPLACE **ARM/SAFE** ADVISORY LIGHT

TM 9-1230-476-20-1.

REPLACE CPG **FIRE CONTROL** PANEL.

TM 9-1230-476-20-1.

CHECK FOR OPEN BETWEEN:
P747-J AND P279-41
P747-H AND P279-38

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

REPLACE MULTI-CHANNEL DIMMER CONTROL.

TM 55-1520-238-23.

END OF TAS

9-32-16. FIRE PULL ENG 1 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-15)

Personnel Required: (para 9-32-15)

References:

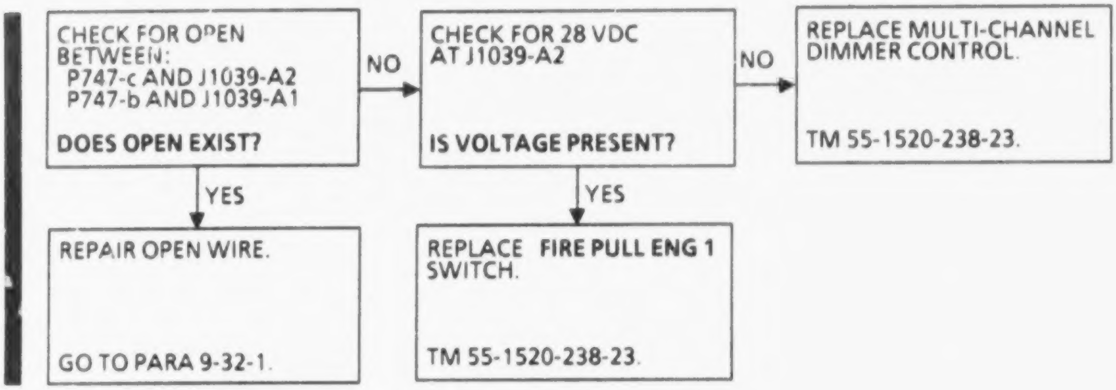
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L90 door removed
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-32-17. FIRE PULL ENG 2 SWITCH - IS NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-15)

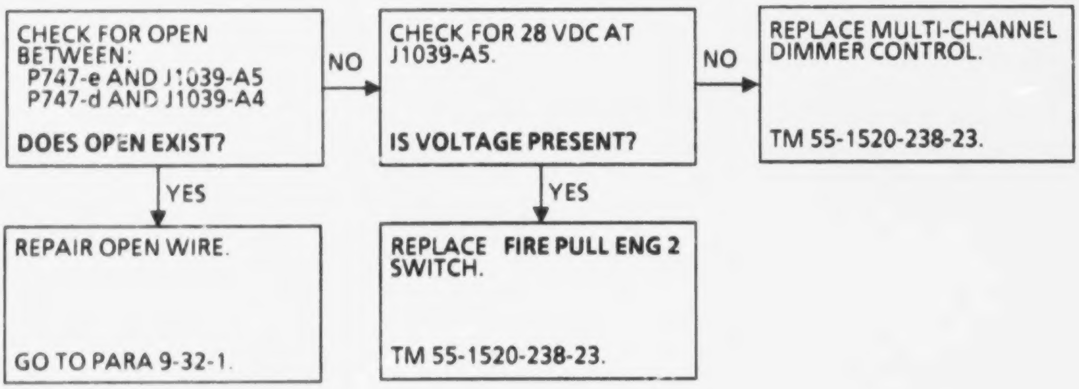
Personnel Required: (para 9-32-15)

References: (para 9-32-16)

Equipment Conditions: (para 9-32-16)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



END OF TASK

9-32-18. PILOT AND CPG ADS INDICATORS - ARE NOT LIGHTED WITH CPG FCC MUX ON

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

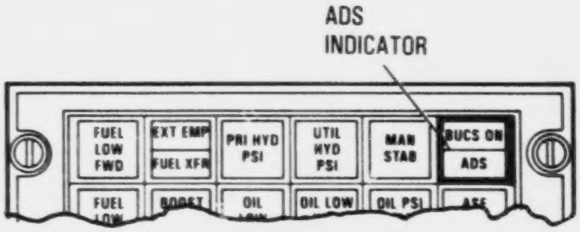
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

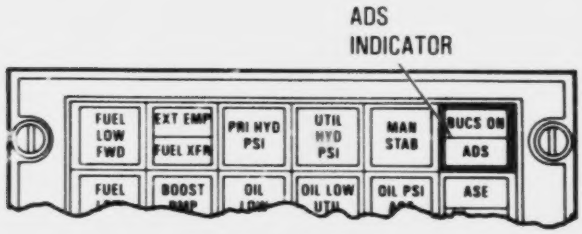
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - cover L40 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

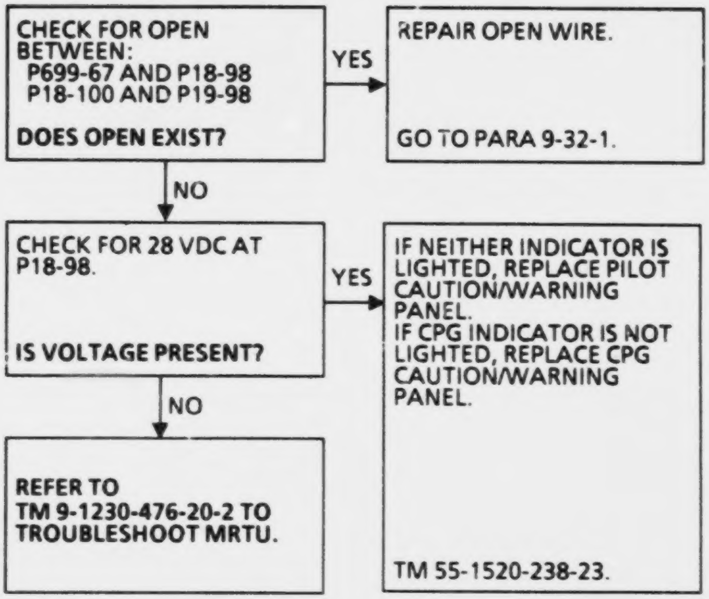


CPG CAUTION/WARNING PANEL



PILOT CAUTION/WARNING PANEL

MM04/1-1175A



CHECK FOR OPEN BETWEEN:
P699-67 AND P18-98
P18-100 AND P19-98

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

CHECK FOR 28 VDC AT P18-98.

IS VOLTAGE PRESENT?

IF NEITHER INDICATOR IS LIGHTED, REPLACE PILOT CAUTION/WARNING PANEL.
IF CPG INDICATOR IS NOT LIGHTED, REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

END OF TASK

9-32-19. CPG TADS INDICATOR - IS NOT LIGHTED WITH TADS SWITCH IN TADS POSITION

Tools: (para 9-32-18)

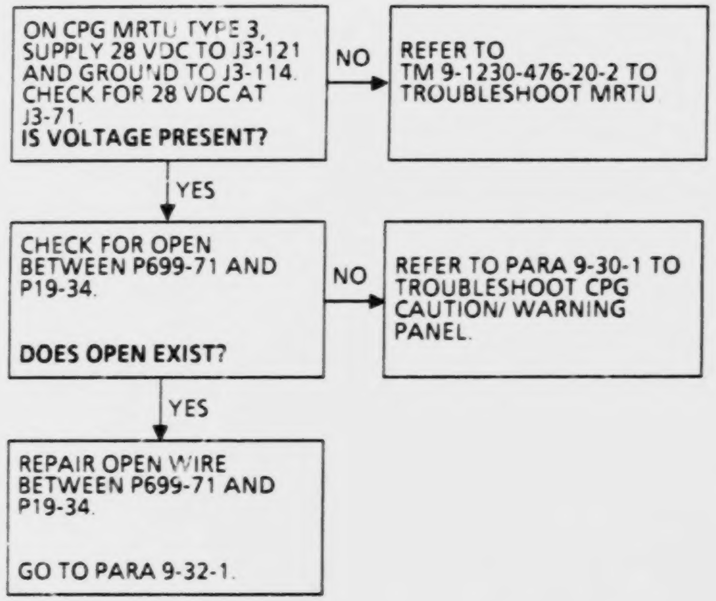
Personnel Required: (para 9-32-18)

References: (para 9-32-18)

Equipment Conditions: (para 9-32-18)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-71.
IS VOLTAGE PRESENT?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU
YES
CHECK FOR OPEN BETWEEN P699-71 AND P19-34.
DOES OPEN EXIST?
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/WARNING PANEL.
YES
REPAIR OPEN WIRE BETWEEN P699-71 AND P19-34.
GO TO PARA 9-32-1.

END OF TASK

9-32-20. PILOT TADS INDICATOR - IS NOT LIGHTED WITH TADS SWITCH IN TADS POSITION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

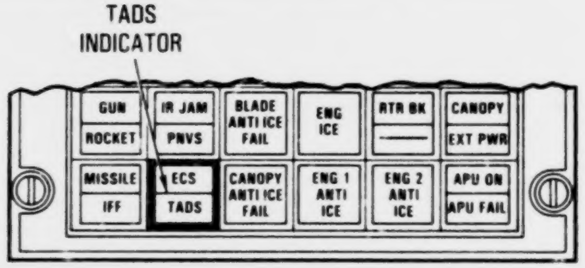
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

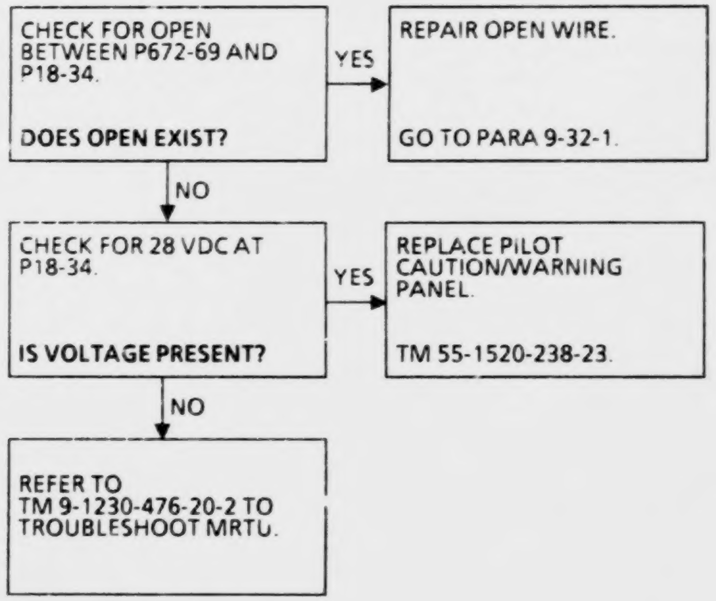
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CAUTION/WARNING PANEL

MM04/1-1178



CHECK FOR OPEN BETWEEN P672-69 AND P18-34.

DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

CHECK FOR 28 VDC AT P18-34.

IS VOLTAGE PRESENT?

REPLACE PILOT CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

END OF TASK

9-32-21. CPG ROCKET INDICATOR - IS NOT LIGHTED WITH RKT SWITCH IN NORM POSITION

Tools: (para 9-32-20)

Personnel Required: (para 9-32-20)

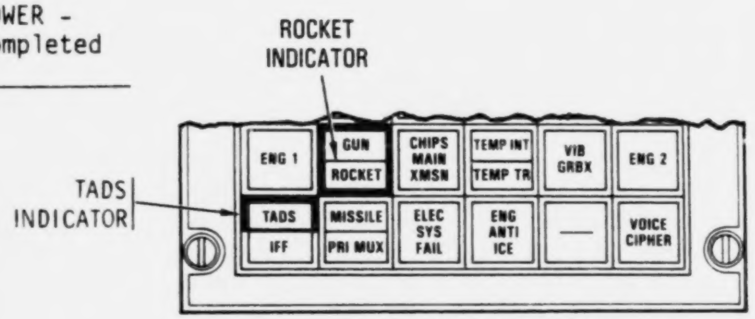
References: (para 9-32-20)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - cover L40 removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

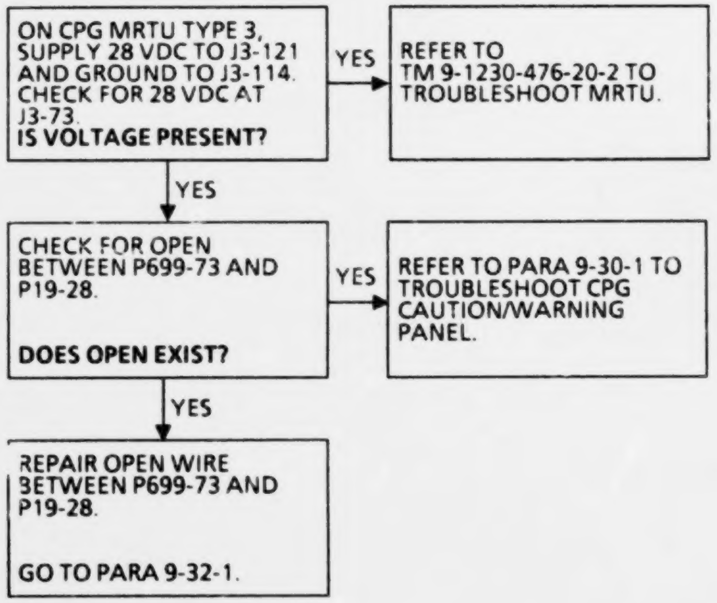
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG CAUTION/WARNING PANEL

MM04/1-1157



ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-73.

IS VOLTAGE PRESENT?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

CHECK FOR OPEN BETWEEN P699-73 AND P19-28.

DOES OPEN EXIST?

REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/WARNING PANEL.

REPAIR OPEN WIRE BETWEEN P699-73 AND P19-28.

GO TO PARA 9-32-1.

END OF TASK

9-32-22. PILOT ROCKET INDICATOR - IS NOT LIGHTED WITH RKT SWITCH IN NORM POSITION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

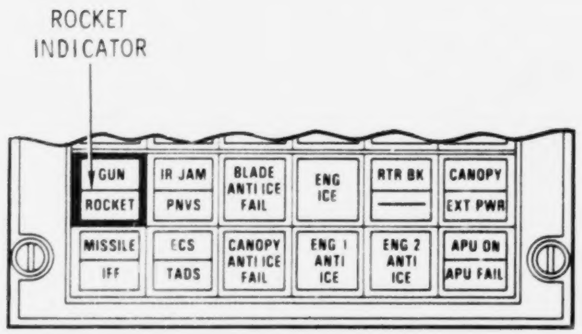
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

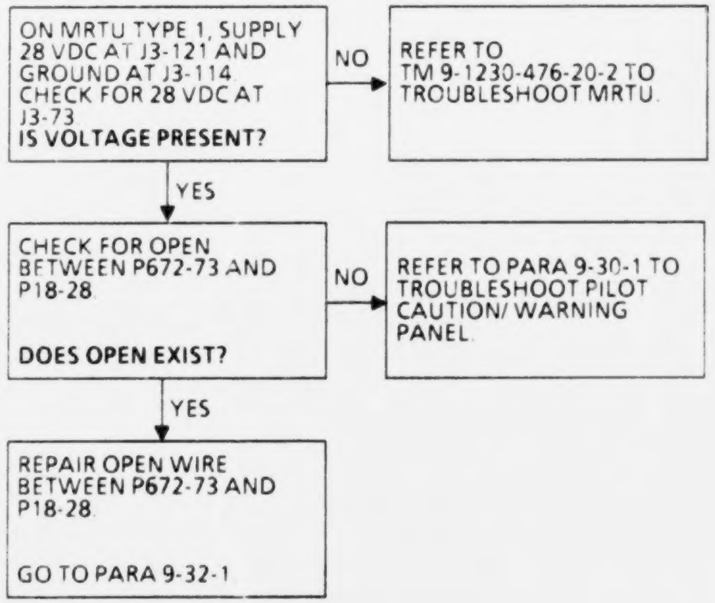
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CAUTION/WARNING PANEL

MM04/1-1179


ON MRTU TYPE 1, SUPPLY 28 VDC AT J3-121 AND GROUND AT J3-114. CHECK FOR 28 VDC AT J3-73. **IS VOLTAGE PRESENT?**

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES: CHECK FOR OPEN BETWEEN P672-73 AND P18-28. **DOES OPEN EXIST?**

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/ WARNING PANEL.

YES: REPAIR OPEN WIRE BETWEEN P672-73 AND P18-28. GO TO PARA 9-32-1

END OF TASK

9-32-23. CPG GUN INDICATOR - IS NOT LIGHTED WITH GUN SWITCH IN NORM POSITION

Tools: (para 9-32-22)

Personnel Required: (para 9-32-22)

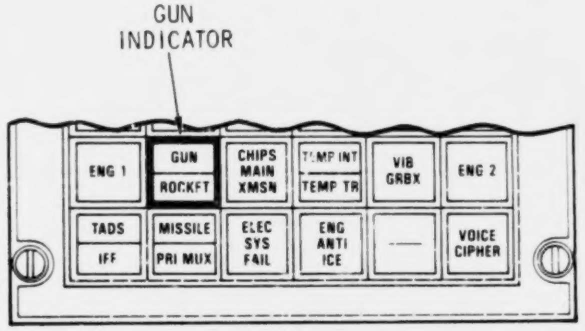
References: (para 9-32-22)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L40 cover removed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

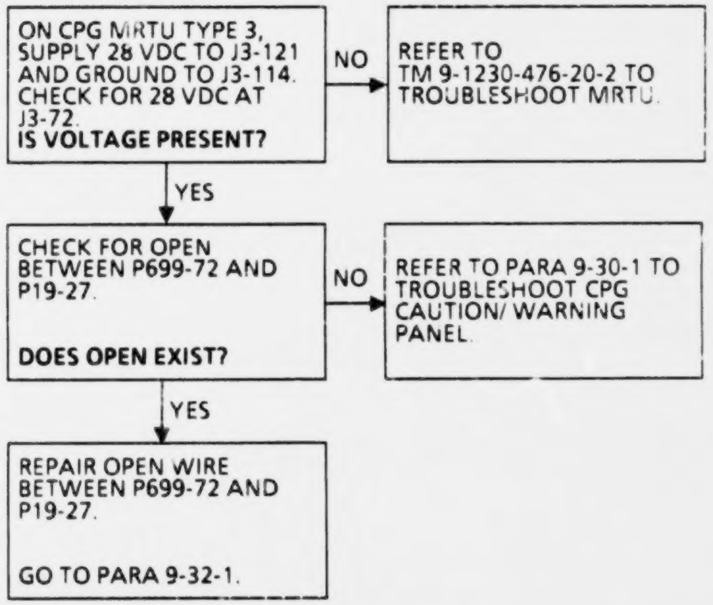
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG CAUTION/WARNING PANEL

MM04/1-1158


ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-72. **IS VOLTAGE PRESENT?**

NO: REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

YES: CHECK FOR OPEN BETWEEN P699-72 AND P19-27. **DOES OPEN EXIST?**

NO: REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/ WARNING PANEL.

YES: REPAIR OPEN WIRE BETWEEN P699-72 AND P19-27. GO TO PARA 9-32-1.

END OF TASK

9-32-24. PILOT GUN INDICATOR - IS NOT LIGHTED WITH GUN SWITCH IN NORM POSITION

Tools: (para 9-32-22)

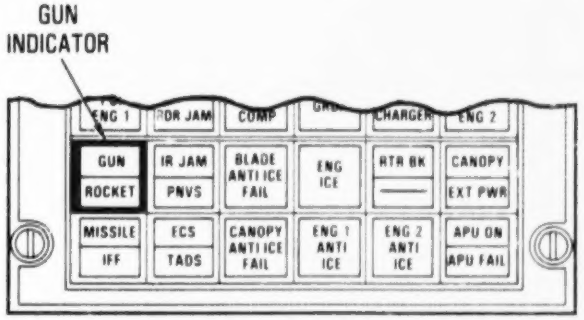
Personnel Required: (para 9-32-22)

References: (para 9-32-22)

Equipment Conditions: (para 9-32-22)

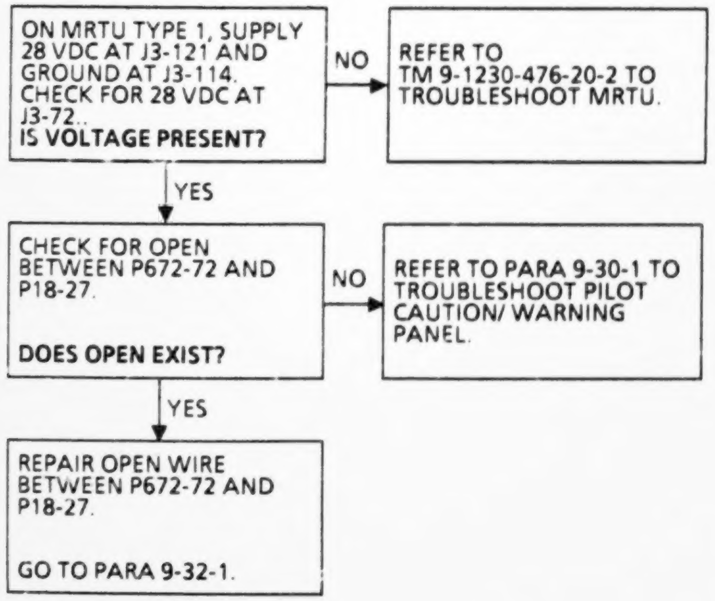
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CAUTION/WARNING PANEL

MM04/1-1180A


ON MRTU TYPE 1, SUPPLY 28 VDC AT J3-121 AND GROUND AT J3-114. CHECK FOR 28 VDC AT J3-72.
IS VOLTAGE PRESENT?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
CHECK FOR OPEN BETWEEN P672-72 AND P18-27.
DOES OPEN EXIST?
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/ WARNING PANEL.
YES
REPAIR OPEN WIRE BETWEEN P672-72 AND P18-27.
GO TO PARA 9-32-1.

END OF TASK

9-32-25. CPG MISSILE INDICATOR - IS NOT LIGHTED WITH MISSILE SWITCH IN ON POSITION

Tools: (para 9-32-22)

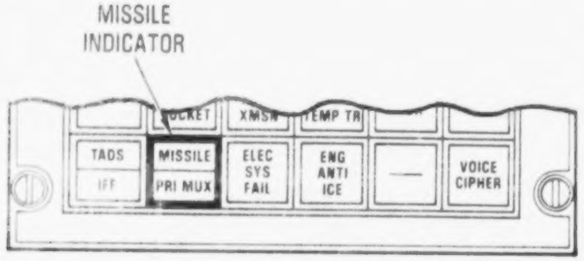
Personnel Required: (para 9-32-22)

References: (para 9-32-22)

Equipment Conditions: (para 9-32-23)

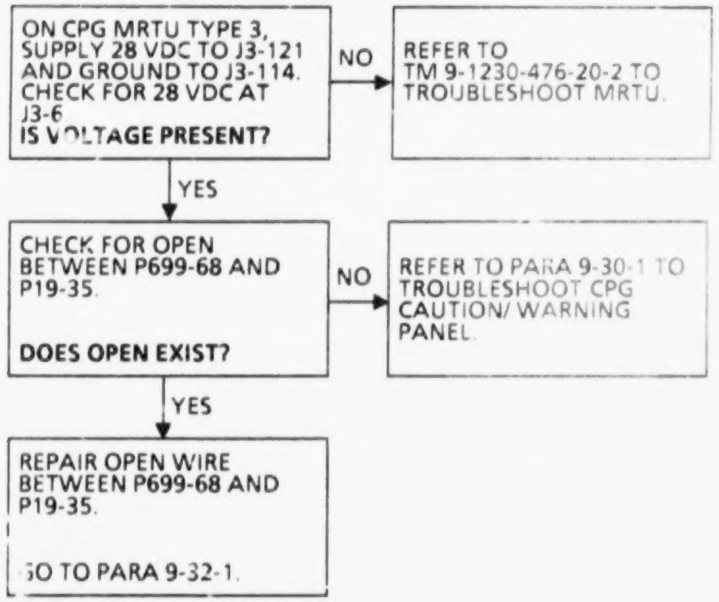
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG CAUTION/WARNING PANEL

MM04/1-1159A


ON CPG MRTU TYPE 3, SUPPLY 28 VDC TO J3-121 AND GROUND TO J3-114. CHECK FOR 28 VDC AT J3-6
IS VOLTAGE PRESENT?
NO
REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.
YES
CHECK FOR OPEN BETWEEN P699-68 AND P19-35.
DOES OPEN EXIST?
NO
REFER TO PARA 9-30-1 TO TROUBLESHOOT CPG CAUTION/ WARNING PANEL.
YES
REPAIR OPEN WIRE BETWEEN P699-68 AND P19-35.
GO TO PARA 9-32-1.

END OF TASK

9-32-26. PILOT MISSILE INDICATOR - IS NOT LIGHTED WITH MSL SWITCH IN ON POSITION

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10	Aircraft Electrician One person to assist

References:

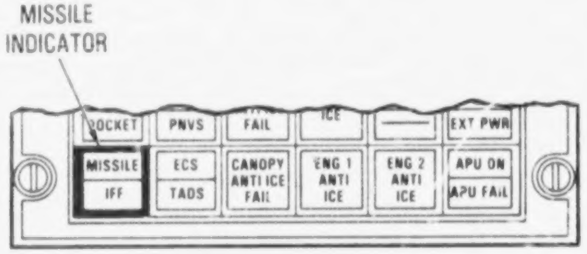
TM 55-1520-238-23
TM 9-1230-476-20-2

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - R90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed

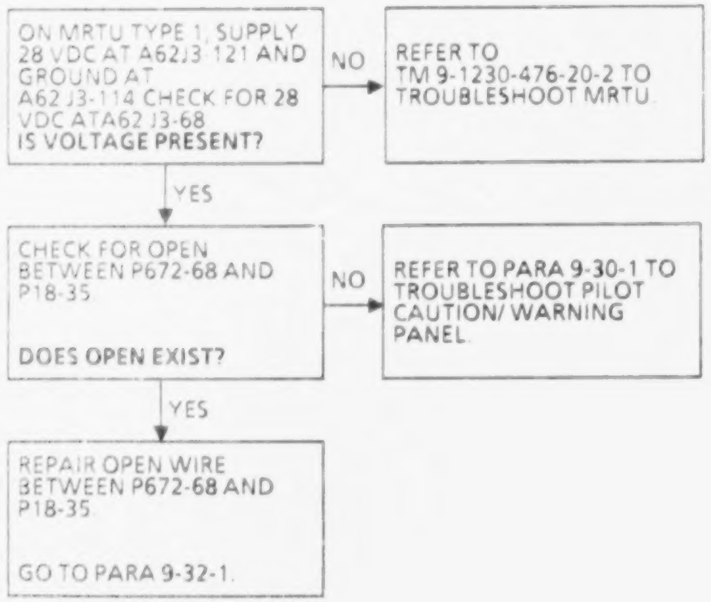
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CAUTION/WARNING PANEL

MM04/1-1149A



ON MRTU TYPE 1, SUPPLY 28 VDC AT A62J3-121 AND GROUND AT A62 J3-114 CHECK FOR 28 VDC AT A62 J3-68
IS VOLTAGE PRESENT?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

CHECK FOR OPEN BETWEEN P672-68 AND P18-35.
DOES OPEN EXIST?

REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/ WARNING PANEL.

REPAIR OPEN WIRE BETWEEN P672-68 AND P18-35.
GO TO PARA 9-32-1.

END OF TASK

9-32-27. CPG PRI MUX INDICATOR - IS NOT LIGHTED WITH MUX SWITCH IN SEC POSITION

Tools: (para 9-32-26)

Personnel Required: (para 9-32-26)

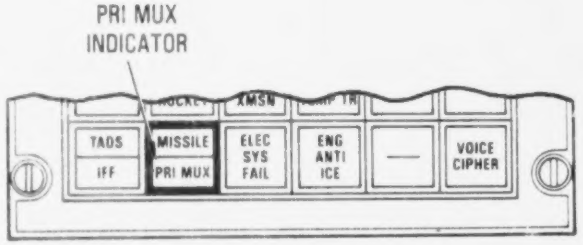
References: (para 9-32-26)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions - L40 cover removed

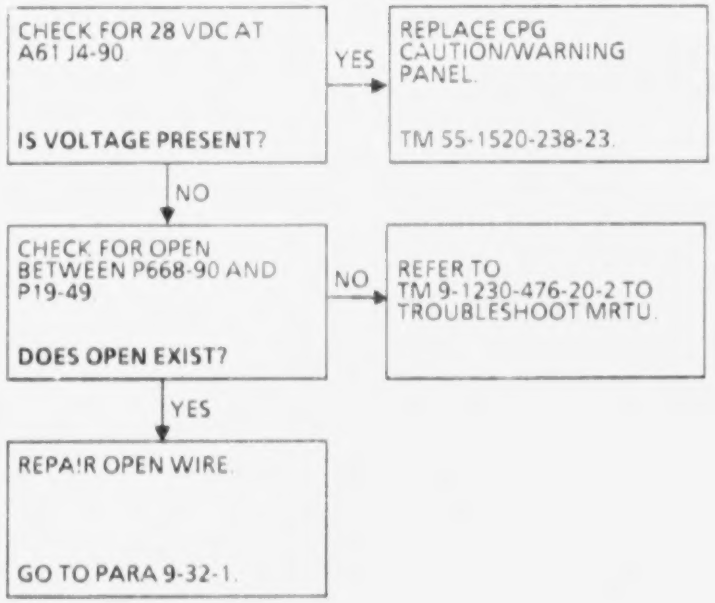
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG CAUTION/WARNING PANEL

MM04/1-1160A



CHECK FOR 28 VDC AT A61 J4-90.
IS VOLTAGE PRESENT?

REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.

CHECK FOR OPEN BETWEEN P668-90 AND P19-49.
DOES OPEN EXIST?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

REPAIR OPEN WIRE.
GO TO PARA 9-32-1.

END OF TASK

9-32-28. CPG MASTER CAUTION RESET - DOES NOT FUNCTION

Tools: (para 9-32-26)

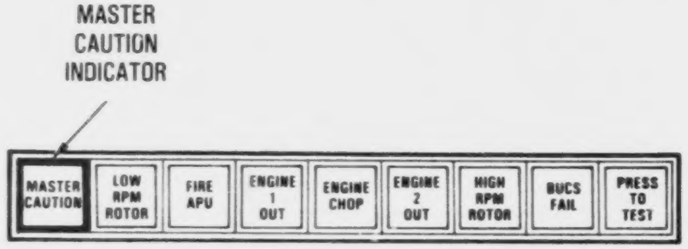
Personnel Required: (para 9-32-26)

References:

TM 55-1520-238-23

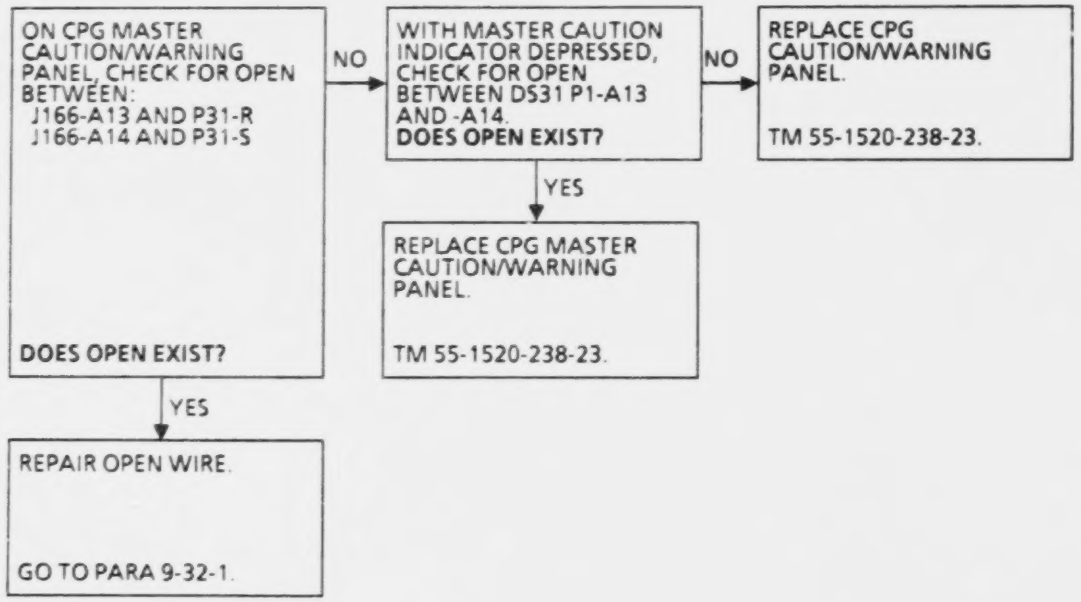
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed



CPG MASTER CAUTION/WARNING INDICATOR

MM04/1-1177



ON CPG MASTER CAUTION/WARNING PANEL, CHECK FOR OPEN BETWEEN:
J166-A13 AND P31-R
J166-A14 AND P31-S

DOES OPEN EXIST?

WITH MASTER CAUTION INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS31 P1-A13 AND -A14.
DOES OPEN EXIST?

REPLACE CPG CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE CPG MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPAIR OPEN WIRE.

GO TO PARA 9-32-1.

END OF TASK

9-32-29. PILOT PRI MUX INDICATOR - IS NOT LIGHTED WITH MUX SWITCH IN SEC POSITION

Tools: (para 9-32-26)

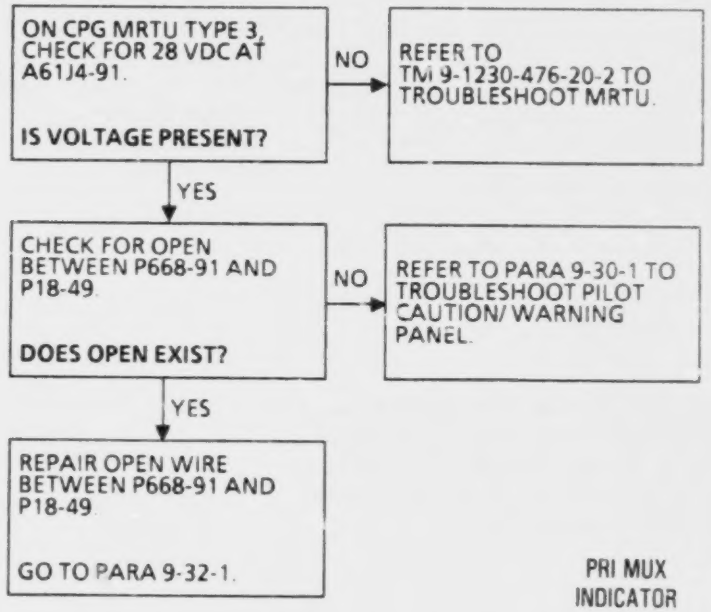
Personnel Required: (para 9-32-26)

References: (para 9-32-26)

Equipment Conditions: (para 9-32-26)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG MRTU TYPE 3, CHECK FOR 28 VDC AT A61J4-91.

IS VOLTAGE PRESENT?

REFER TO TM 9-1230-476-20-2 TO TROUBLESHOOT MRTU.

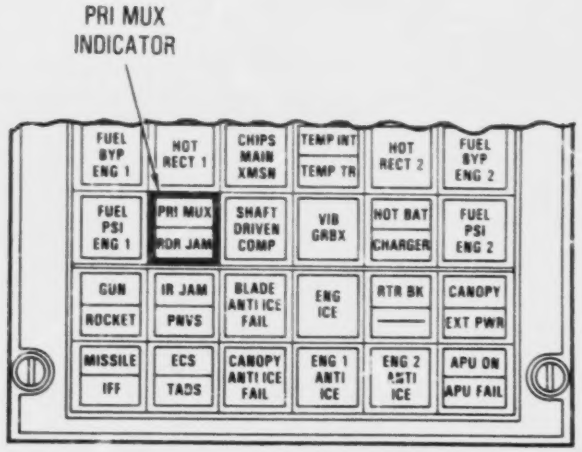
CHECK FOR OPEN BETWEEN P668-91 AND P18-49.

DOES OPEN EXIST?

REFER TO PARA 9-30-1 TO TROUBLESHOOT PILOT CAUTION/WARNING PANEL.

REPAIR OPEN WIRE BETWEEN P668-91 AND P18-49.

GO TO PARA 9-32-1.



PILOT CAUTION/WARNING PANEL

MM04/1-1156

END OF TASK

9-32-30. CPG CAUTION/WARNING EDGE-LIGHT PANEL - IS NOT LIGHTED

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Electrical Repairer	5180-00-323-4915
Multimeter, Digital AN/PSM-45	6625-01-1[illegible] -2512

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

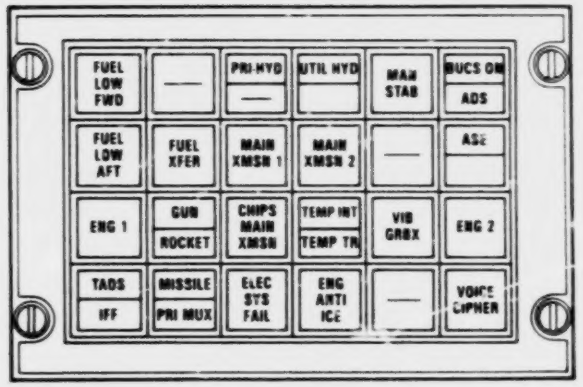
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed
	External power application - Electrical
Para 1-3-2	ICS connected

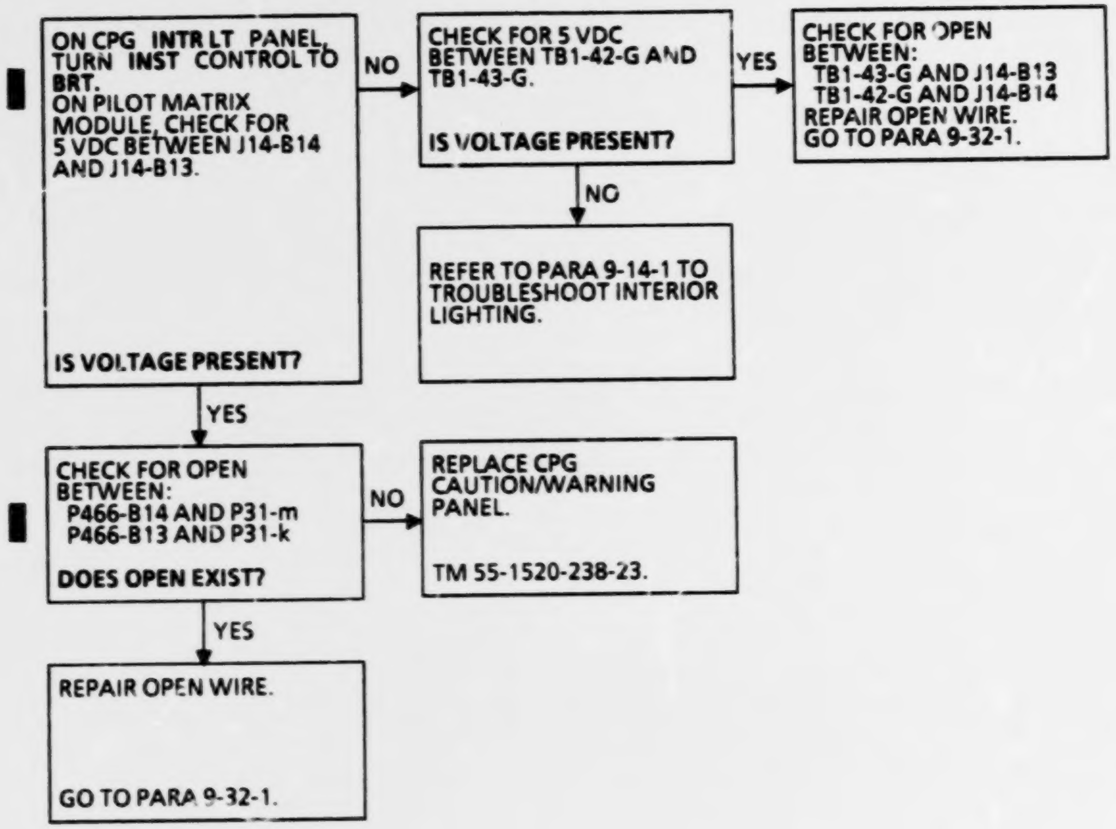
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



CPG CAUTION / WARNING PANEL

MM04/1-1150A



ON CPG INTR LT PANEL, TURN INST CONTROL TO BRT. ON PILOT MATRIX MODULE, CHECK FOR 5 VDC BETWEEN J14-B14 AND J14-B13. IS VOLTAGE PRESENT?
NO
CHECK FOR 5 VDC BETWEEN TB1-42-G AND TB1-43-G. IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: TB1-43-G AND J14-B13 TB1-42-G AND J14-B14 REPAIR OPEN WIRE. GO TO PARA 9-32-1.
NO
REFER TO PARA 9-14-1 TO TROUBLESHOOT INTERIOR LIGHTING.
YES
CHECK FOR OPEN BETWEEN: P466-B14 AND P31-m P466-B13 AND P31-k DOES OPEN EXIST?
NO
REPLACE CPG CAUTION/WARNING PANEL. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-32-1.

END OF TASK

9-32-31. CPG CAUTION/WARNING INDICATORS - DO NOT INCREASE IN BRIGHTNESS

Tools: (para 9-32-30)

Personnel Required: (para 9-32-30)

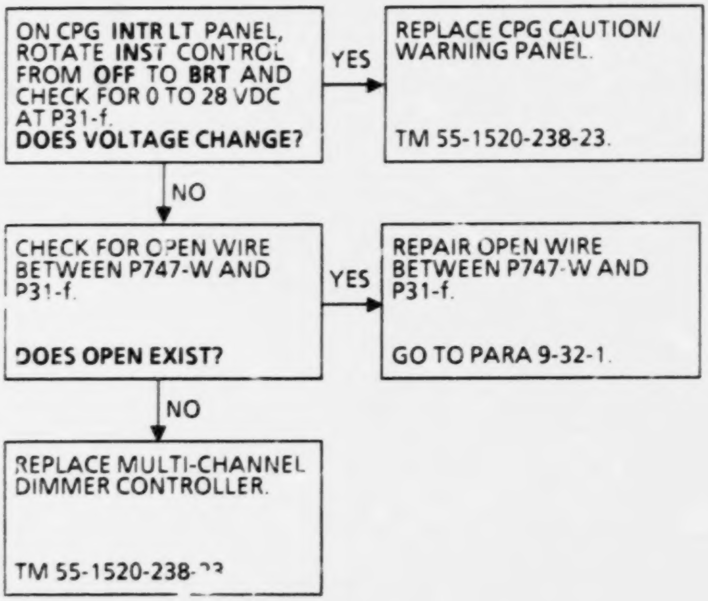
References: (para 9-32-30)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



ON CPG INTR LT PANEL, ROTATE **INST** CONTROL FROM **OFF** TO **BRT** AND CHECK FOR 0 TO 28 VDC AT P31-f.
DOES VOLTAGE CHANGE?

REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.

CHECK FOR OPEN WIRE BETWEEN P747-W AND P31-f.
DOES OPEN EXIST?

REPAIR OPEN WIRE BETWEEN P747-W AND P31-f.
GO TO PARA 9-32-1.

REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23

END OF TASK

9-32-32. CPG ARM/SAFE, FIRE PULL ENG 1 AND 2 INDICATORS - ARE NOT LIGHTED WITH PRESS TO TEST INDICATOR DEPRESSED

Tools: (para 9-32-30)

Personnel Required: (para 9-32-30)

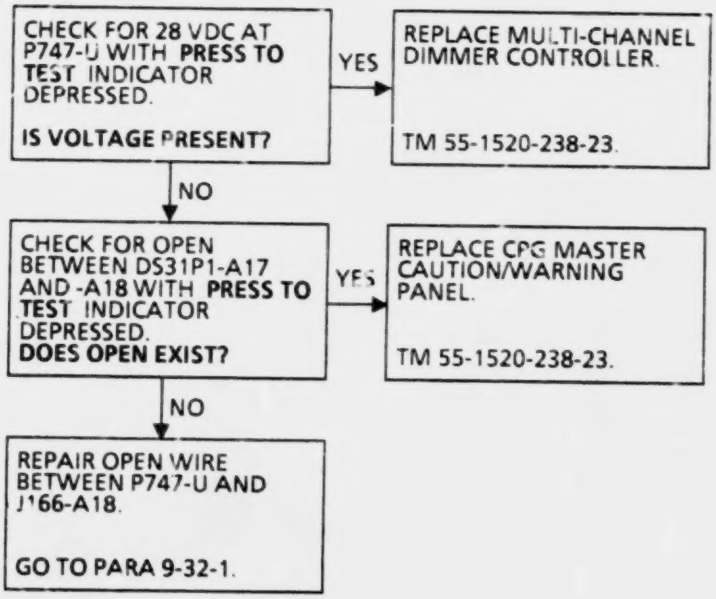
References: (para 9-32-30)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Access provisions L90 door opened
Para 9-5-2	EXTERNAL POWER - POWER UP completed
Para 1-3-2	ICS connected

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT P747-U WITH PRESS TO TEST INDICATOR DEPRESSED.
IS VOLTAGE PRESENT?
YES
REPLACE MULTI-CHANNEL DIMMER CONTROLLER.
TM 55-1520-238-23.
NO
CHECK FOR OPEN BETWEEN DS31P1-A17 AND -A18 WITH PRESS TO TEST INDICATOR DEPRESSED.
DOES OPEN EXIST?
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
NO
REPAIR OPEN WIRE BETWEEN P747-U AND J166-A18.
GO TO PARA 9-32-1.

END OF TASK

9-33-1. AUDIO WARNING SYSTEM - OPERATIONAL CHECK

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Headset (2)	5965-00-755-4656

Personnel Required:

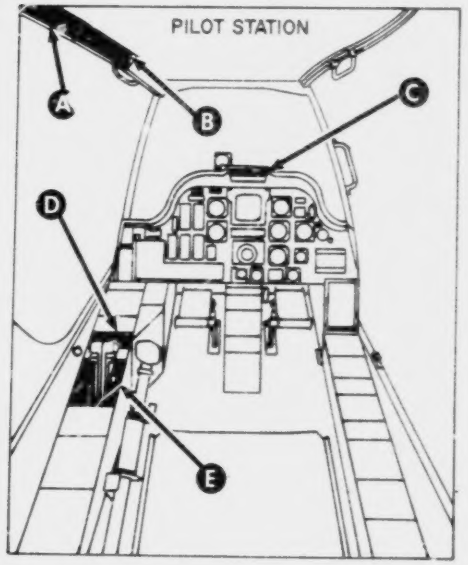
68F10 Aircraft Electrician
One person to assist

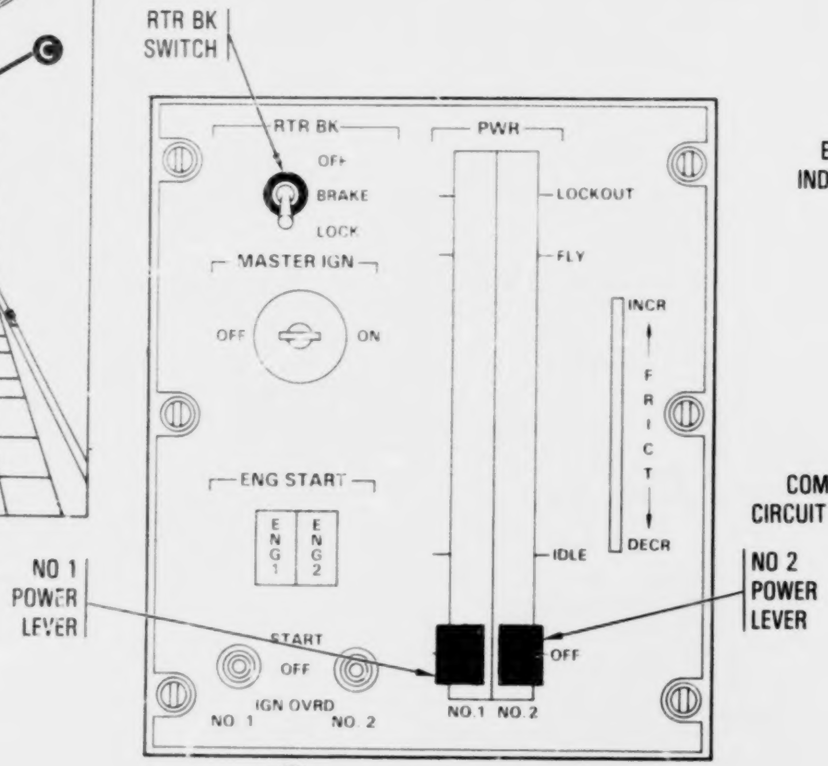
References:

TM 55-1520-238-23
TM 11-1520-238-23-2

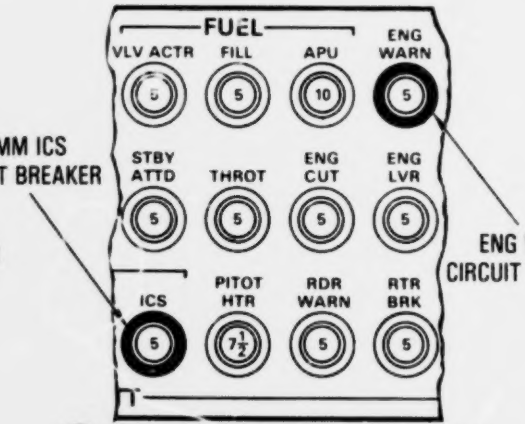
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
TM 11-1520-238-23-2	ICS operational check completed
Para 9-31-1	PILOT CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK completed
Para 9-32-1	CPG CAUTION AND WARNING SYSTEM - OPERATIONAL CHECK completed

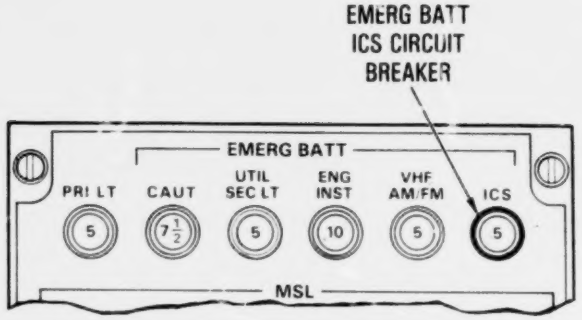




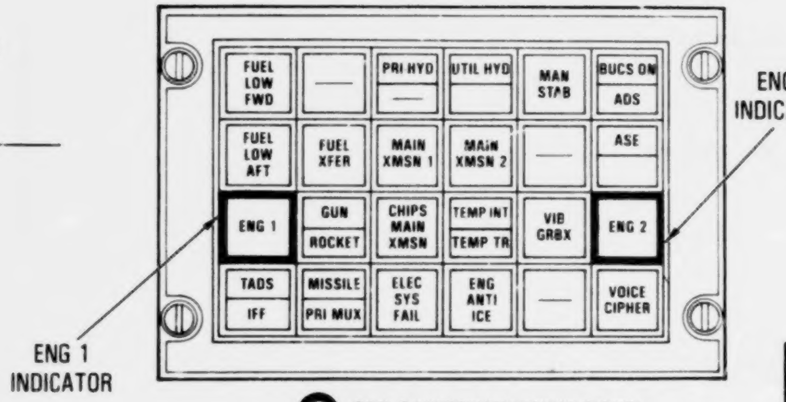
E PILOT POWER QUADRANT PANEL



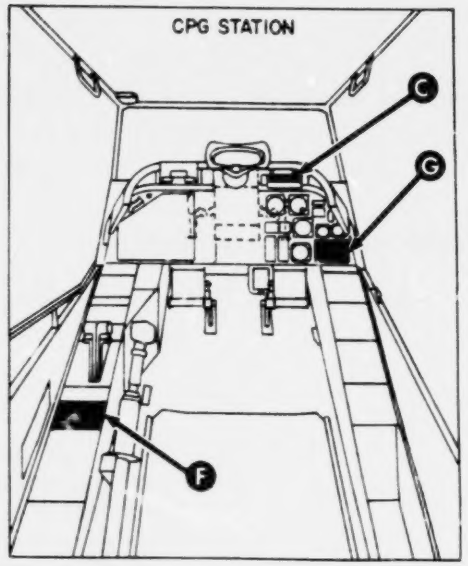
B PILOT CENTER CIRCUIT BREAKER PANEL

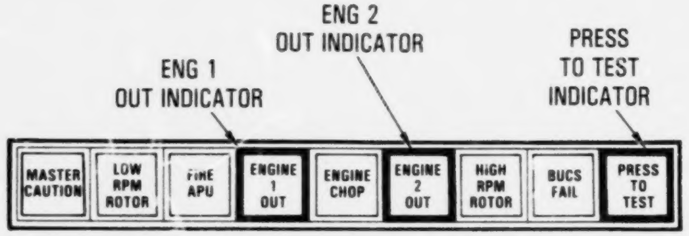


F CPG CIRCUIT BREAKER PANEL NO.1

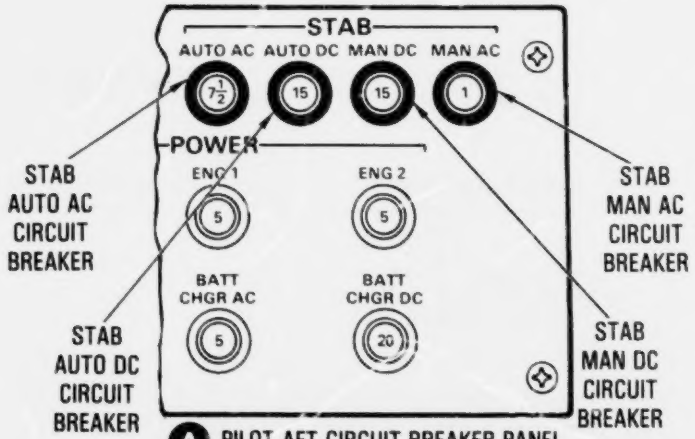


G CPG CAUTION/WARNING PANEL





C MASTER CAUTION/WARNING PANEL (TYPICAL)


STAB
AUTO AC
7½
AUTO DC
15
MAN DC
15
MAN AC
1
POWER
ENG 1
5
ENG 2
5
BATT CHGR AC
5
BATT CHGR DC
20
STAB AUTO AC CIRCUIT BREAKER
STAB AUTO DC CIRCUIT BREAKER
STAB MAN AC CIRCUIT BREAKER
STAB MAN DC CIRCUIT BREAKER

A PILOT AFT CIRCUIT BREAKER PANEL

MM04/1-1030-1B

GO TO NEXT PAGE

9-33-1. AUDIO WARNING SYSTEM - OPERATIONAL CHECK (cont)

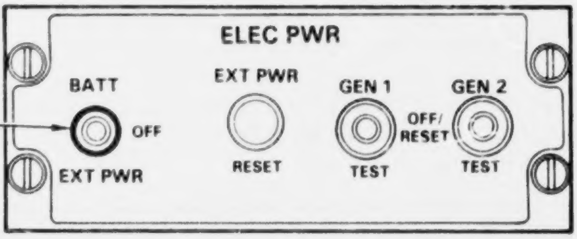
NOTE

If a false engine out warning occurs for an operating engine, during an inflight single engine maneuver requiring high power settings resulting in the engine **Np** (power turbine speed) dropping below 89%, go to para 9-33-17.

A. Perform operational check as follows:

TASK	RESULT
1. On pilot circuit breaker panel, check that **ENG WARN**, **COMM ICS**, **STAB AUTO AC**, **STAB AUTO DC**, **STAB MAN DC**, and **STAB MAN AC** circuit breakers are closed.	If **ENG WARN** circuit breaker does not stay closed, go to para 9-33-4. If **COMM** ICS circuit breaker does not stay closed, refer to TM 11-1520-238-23-2 to troubleshoot intercom system. If **STAB AUTO AC**, **STAB AUTO DC**, **STAB MAN DC**, and **STAB MAN AC** circuit breakers do not stay closed, go to Chapter 11.
2. On CPG circuit breaker panel No. 1, check that **EMERG BATT ICS** circuit breaker is closed.	If **EMERG BATT ICS** circuit breaker does not stay closed, refer to TM 11-1520-238-23-2 to troubleshoot intercom system.
3. On **ELEC PWR** panel, cycle **BATT/EXT PWR** switch to **OFF**, and back to **EXT PWR**. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both headsets, go to para 9-33-5. If audio warning is heard in one but not the other headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
4. On pilot master caution/warning panel, depress **ENGINE 1 OUT** indicator. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-6.

BATT/EXT PWR SWITCH



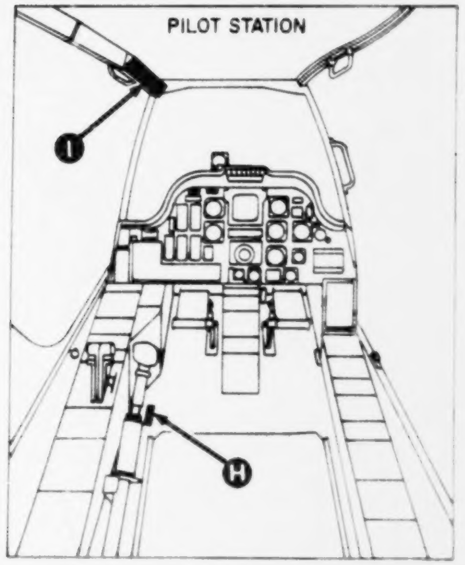
Ⓓ ELEC PWR PANEL

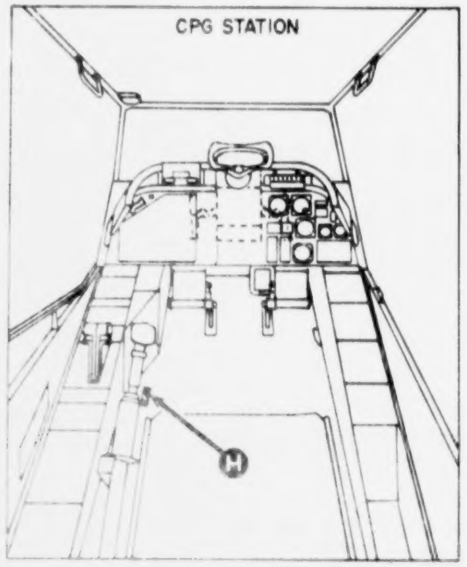
MM04/1-1030-2A

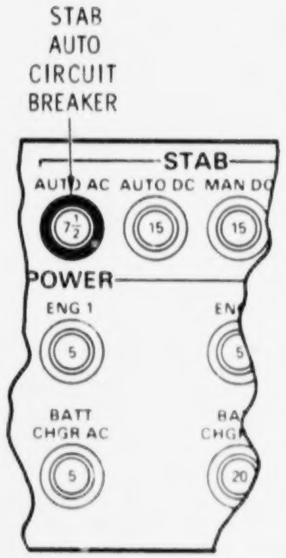
TASK	RESULT
5. On pilot power quadrant panel, set **RTR BK** to **OFF**.	
6. On pilot power quadrant panel, set **NO. 1** power lever to **FLY**. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both pilot and CPG headsets, replace engine out warning unit (TM 55-1520-238-23). If audio warning is heard in only one headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
7. On pilot master caution/warning panel, check that **ENGINE 1 OUT** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-8.
8. On pilot power quadrant panel, cycle **NO. 1** power lever to **OFF** and back to **FLY**.	
9. On CPG caution/warning panel, check that **ENG 1** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-7.
10. On CPG master caution/warning panel, depress **ENGINE 1 OUT** indicator. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-9.
11. On pilot power quadrant panel, set **NO. 1** power lever to **OFF**. Set **NO. 2** power lever to **FLY**. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both pilot and CPG headsets, replace engine out warning unit (TM 55-1520-238-23). If audio warning is heard in only one headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
12. On pilot master caution warning panel, check that **ENGINE 2 OUT** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-10.
13. Press **ENGINE 2 OUT** indicator, check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-11.

GO TO NEXT PAGE

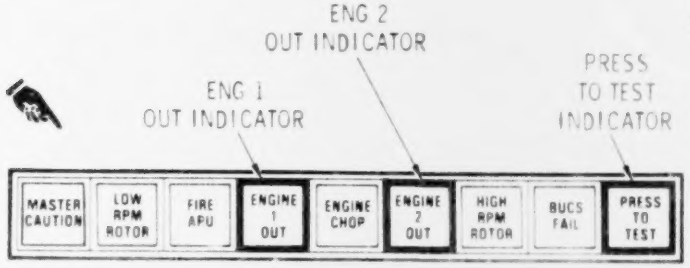
9-33-1. AUDIO WARNING SYSTEM - OPERATIONAL CHECK (cont)



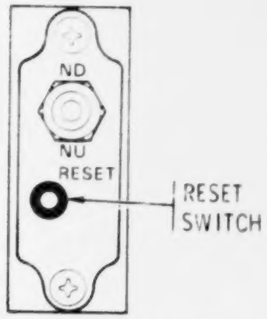




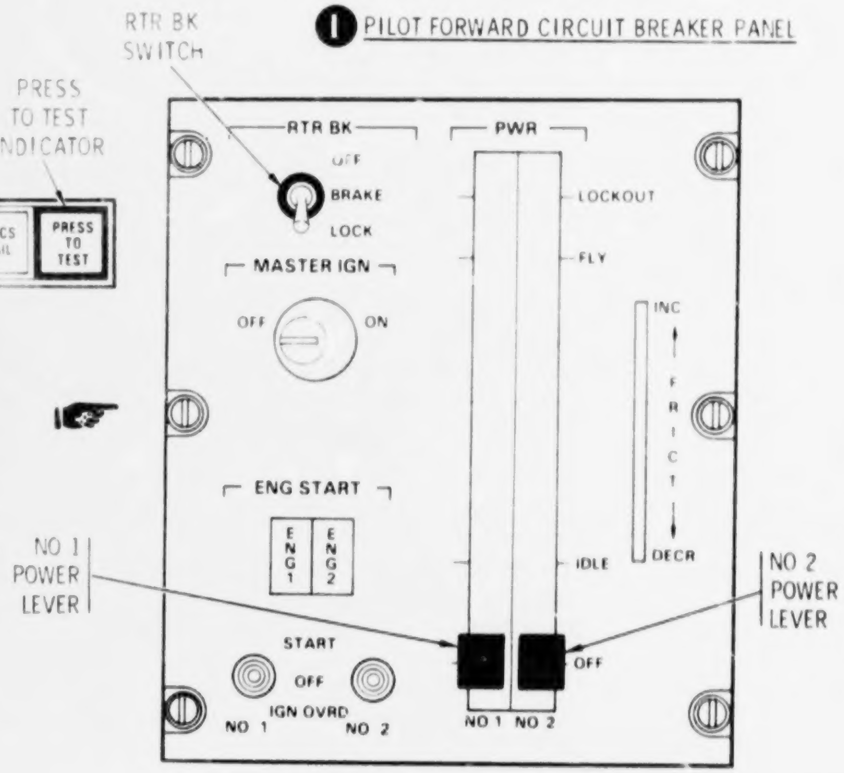
I PILOT FORWARD CIRCUIT BREAKER PANEL



MASTER CAUTION/WARNING PANEL
(TYPICAL)



H COLLECTIVE STICK STABILATOR
MANUAL CONTROL SWITCH PANEL
(TYPICAL)



PILOT POWER QUADRANT PANEL

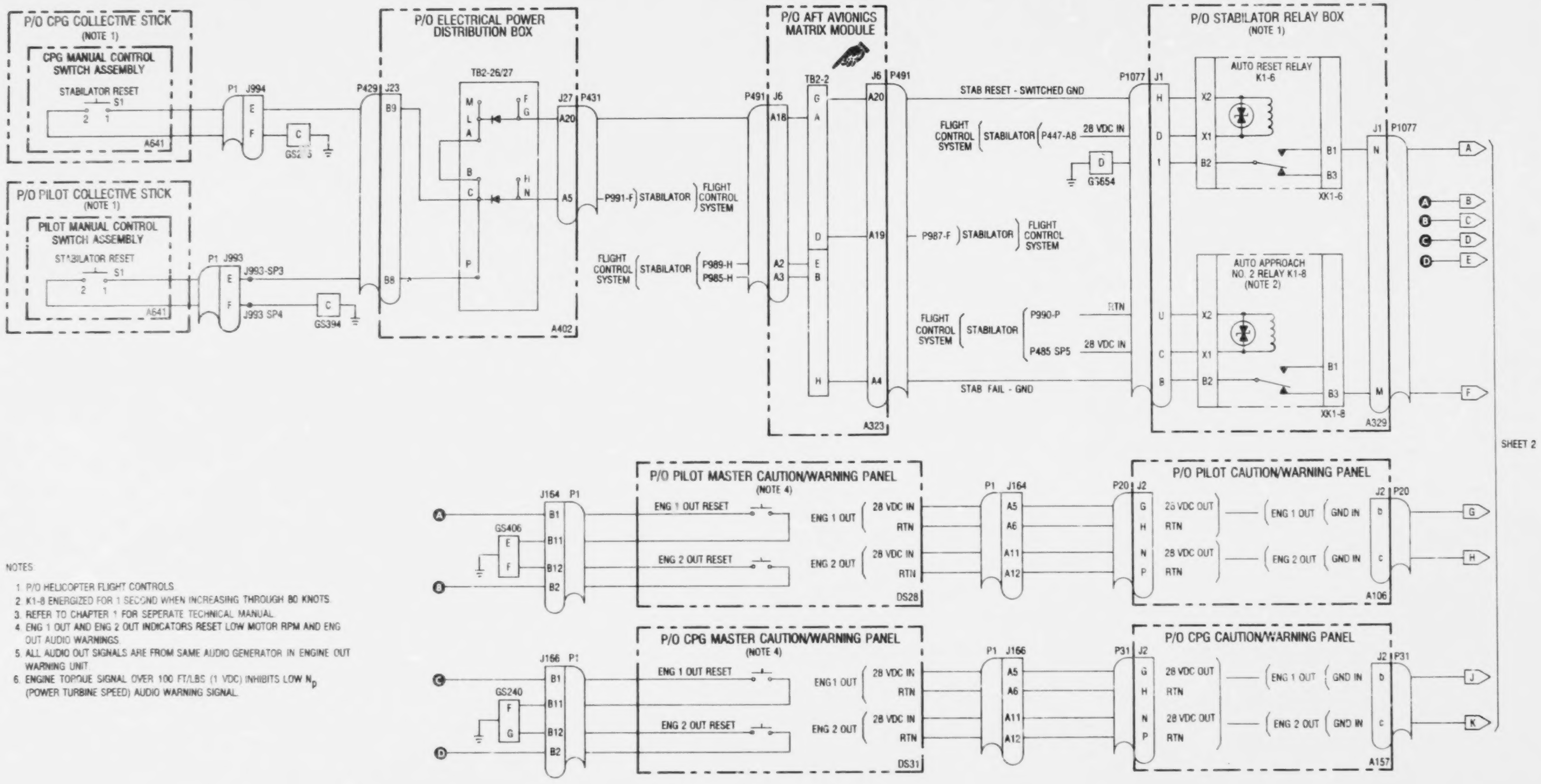
MM04/1-1030-3B

TASK	RESULT
14. On pilot power quadrant panel, cycle **NO. 2** power lever to **OFF** and back to **FLY**.	
15. On CPG caution/warning panel, check that **ENG 2** indicator is lighted and flashing.	If indicator is not lighted and flashing, go to para 9-33-12.
16. On CPG master caution/warning panel, press **ENGINE 2 OUT** indicator. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-13.
17. On pilot power quadrant panel, set **NO. 2** power lever to **OFF** position, and **RTR BK** to **LOCK** position.	
18. On pilot circuit breaker panel, open **STAB AUTO AC** circuit breaker. Check that audio warning is heard in pilot and CPG headsets.	If audio warning is not heard in both headsets, go to para 9-33-14. If audio warning is heard in one but not the other headset, refer to TM 11-1520-238-23-2 to troubleshoot integrated audio warning system.
19. On pilot collective control stick, depress **RESET** switch. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-15.
20. On pilot circuit breaker panel, cycle **STAB AUTO AC** circuit breaker to closed, and back to open position.	
21. On CPG collective control stick, depress **RESET** switch. Check that audio warning is extinguished.	If audio warning is still heard, go to para 9-33-16.
22. On pilot circuit breaker panel, close **STAB AUTO AC** circuit breaker.	

B. Shut down and disconnect GPU from helicopter (TM 55-1520-238-23).

END OF TASK

9-33-2. AUDIO WARNING SYSTEM - INTERCONNECTION DIAGRAM

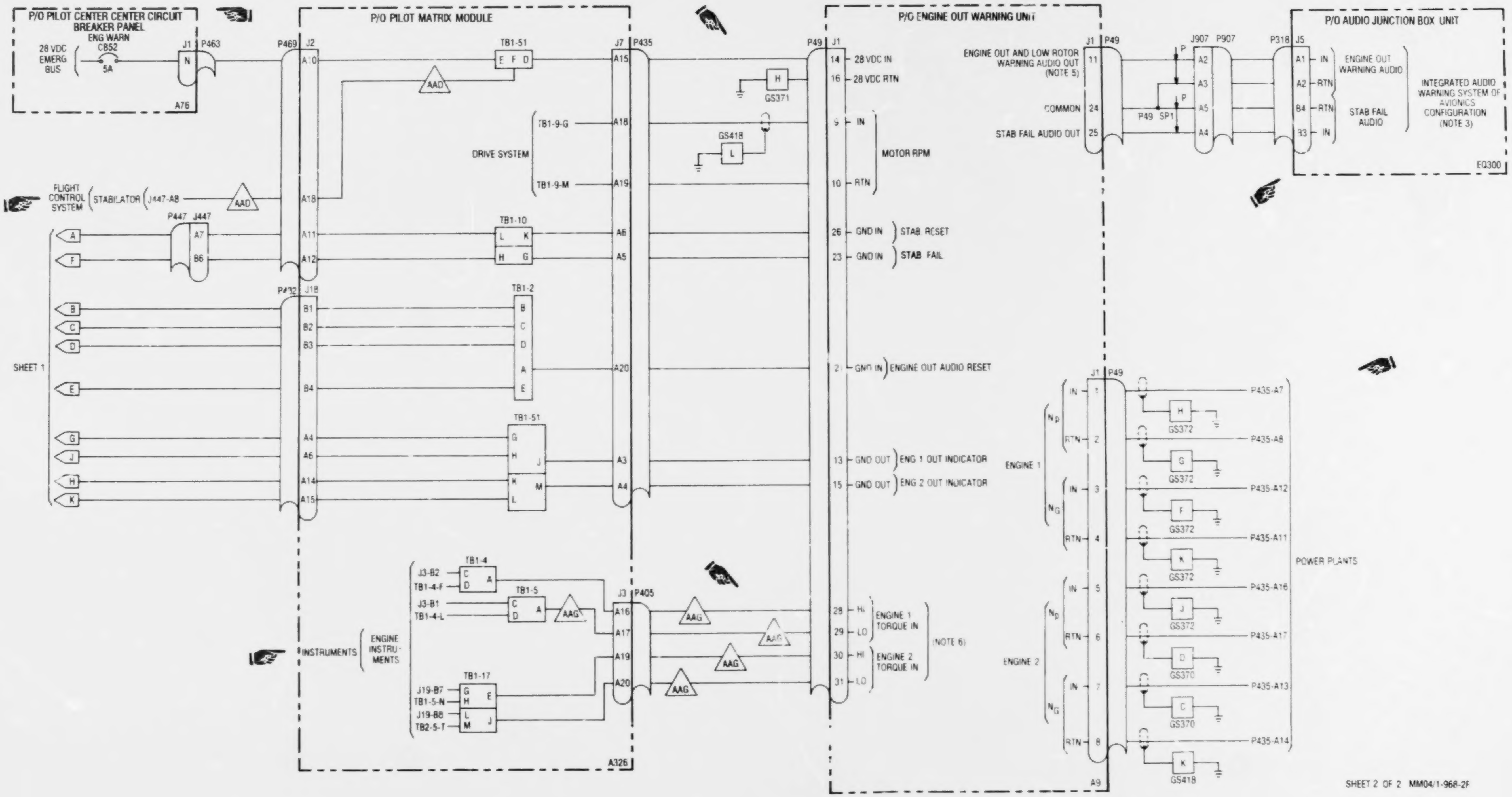

P/O CPG COLLECTIVE STICK (NOTE 1)
CPG MANUAL CONTROL SWITCH ASSEMBLY
STABILATOR RESET S1
A641
P/O PILOT COLLECTIVE STICK (NOTE 1)
PILOT MANUAL CONTROL SWITCH ASSEMBLY
STABILATOR RESET S1
A641
P1 J994
P1 J993
J993-SP3
J993 SP4
GS394
P/O ELECTRICAL POWER DISTRIBUTION BOX
TB2-26/27
P429 J23
B9
B8
J27 P431
A20
A5
A402
P991-F STABILATOR FLIGHT CONTROL SYSTEM
FLIGHT CONTROL SYSTEM STABILATOR P989-H P985-H
P/O AFT AVIONICS MATRIX MODULE
P491 J6
A18
A2
A3
TB2-2
J6 P491
A20
A19
A4
A323
P987-F STABILATOR FLIGHT CONTROL SYSTEM
STAB RESET - SWITCHED GND
FLIGHT CONTROL SYSTEM STABILATOR P447-A8 28 VDC IN
GS654
FLIGHT CONTROL SYSTEM STABILATOR P990-P RTN P485 SP5 28 VDC IN
STAB FAIL - GND
P/O STABILATOR RELAY BOX (NOTE 1)
P1077 J1
AUTO RESET RELAY K1-6
XK1-6
AUTO APPROACH NO. 2 RELAY K1-8 (NOTE 2)
XK1-8
J1 P1077
A329
SHEET 2
P/O PILOT MASTER CAUTION/WARNING PANEL (NOTE 4)
J164 P1
GS406
ENG 1 OUT RESET
ENG 2 OUT RESET
ENG 1 OUT 28 VDC IN RTN
ENG 2 OUT 28 VDC IN RTN
DS28
P1 J164
P/O PILOT CAUTION/WARNING PANEL
P20 J2
28 VDC OUT RTN
ENG 1 OUT GND IN
ENG 2 OUT GND IN
J2 P20
A106
P/O CPG MASTER CAUTION/WARNING PANEL (NOTE 4)
J166 P1
GS240
DS31
P1 J166
P/O CPG CAUTION/WARNING PANEL
P31 J2
J2 P31
A157

NOTES:

1. P/O HELICOPTER FLIGHT CONTROLS
2. K1-8 ENERGIZED FOR 1 SECOND WHEN INCREASING THROUGH 80 KNOTS.
3. REFER TO CHAPTER 1 FOR SEPERATE TECHNICAL MANUAL.
4. ENG 1 OUT AND ENG 2 OUT INDICATORS RESET LOW MOTOR RPM AND ENG OUT AUDIO WARNINGS.
5. ALL AUDIO OUT SIGNALS ARE FROM SAME AUDIO GENERATOR IN ENGINE OUT WARNING UNIT.
6. ENGINE TORQUE SIGNAL OVER 100 FT/LBS (1 VDC) INHIBITS LOW N_p (POWER TURBINE SPEED) AUDIO WARNING SIGNAL.

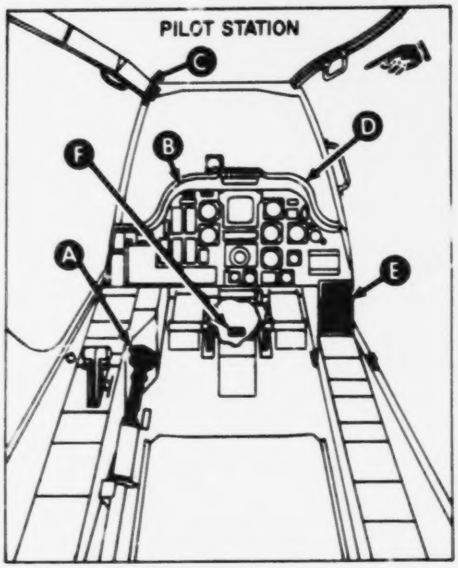
SHEET 1 OF 2 MM04/1-968-1E

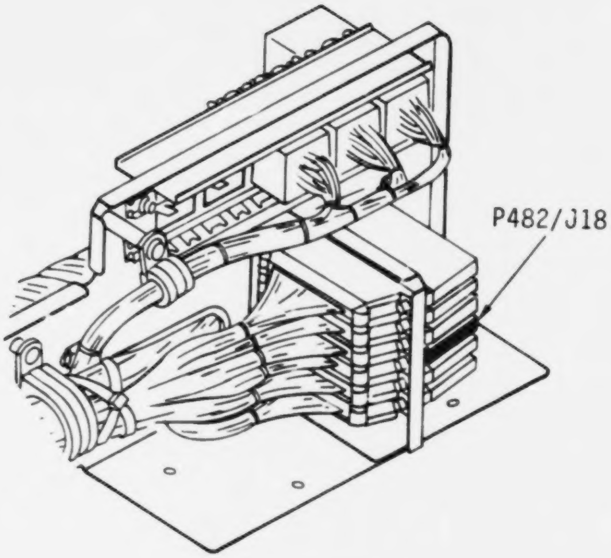
9-33-2. AUDIO WARNING SYSTEM - INTERCONNECTION DIAGRAM (cont)



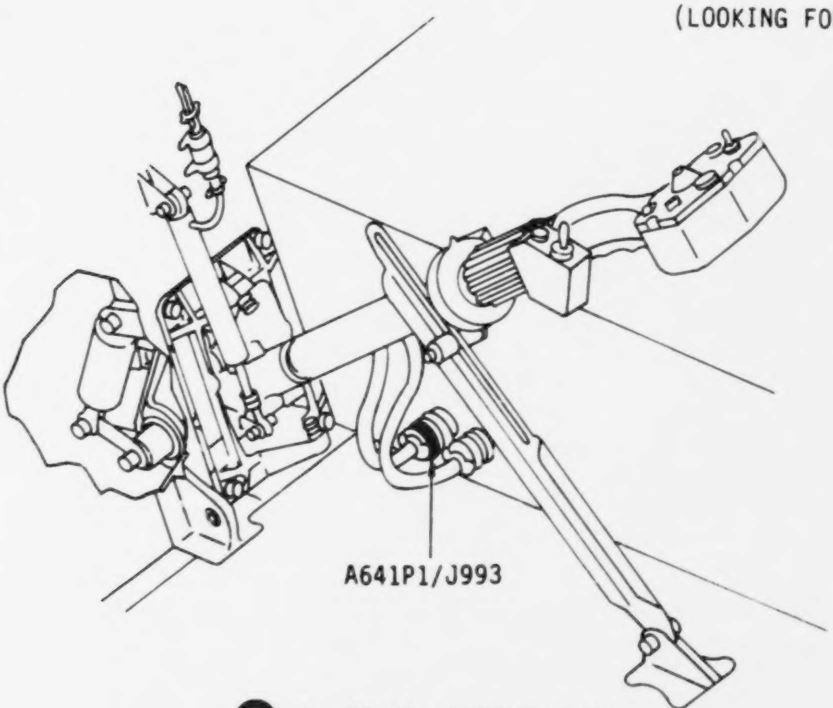
SHEET 2 OF 2 MM04/1-968-2F

9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION

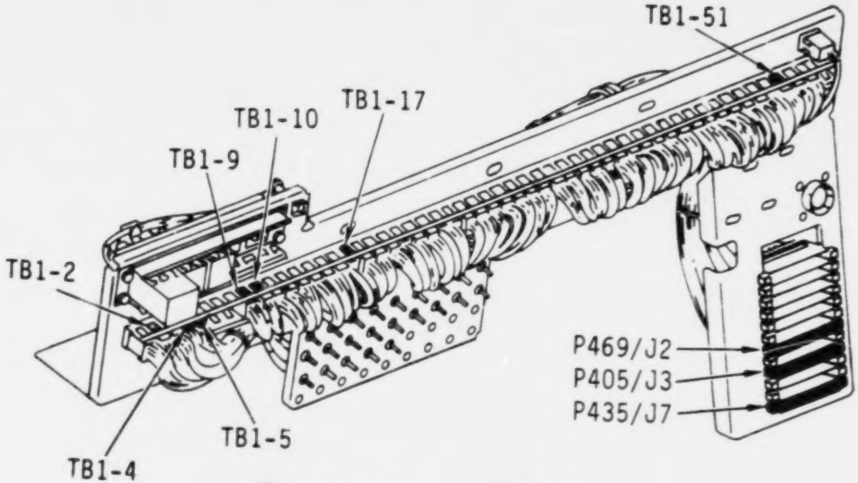




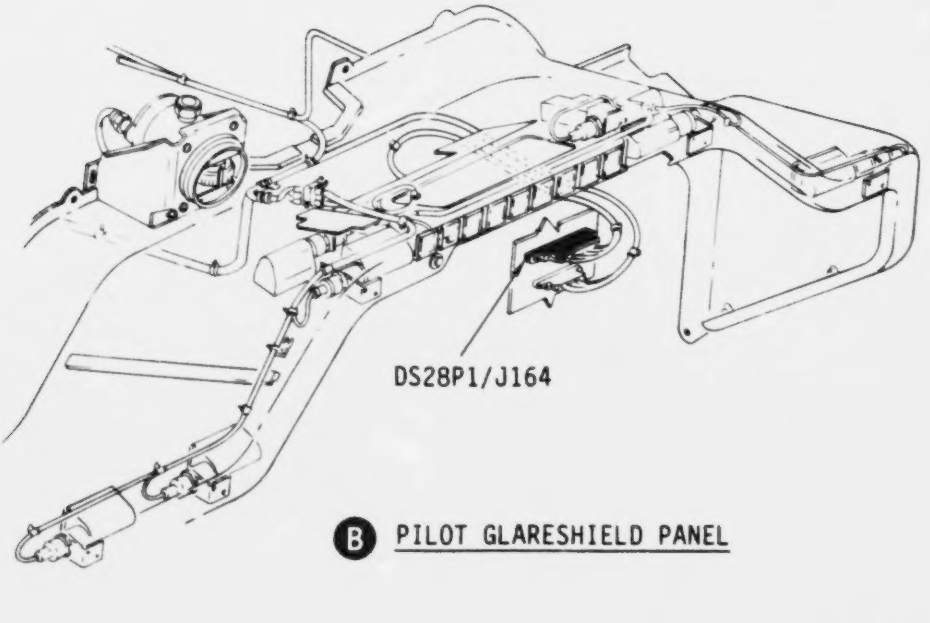
(LOOKING FORWARD)



A PILOT COLLECTIVE STICK

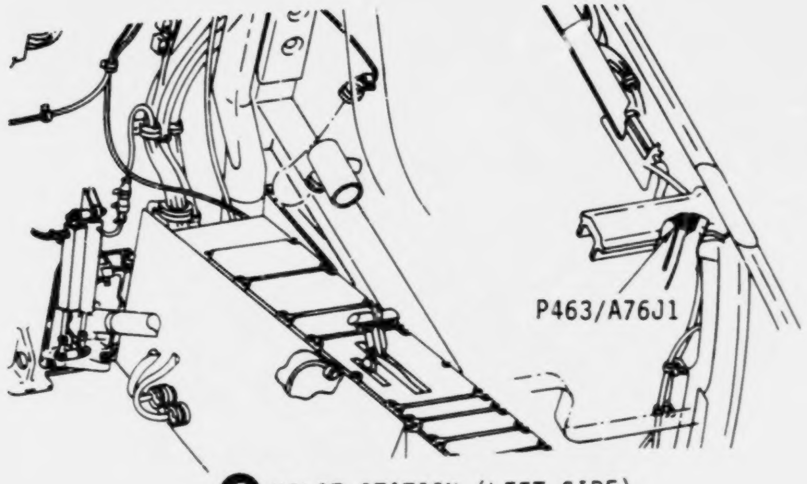


D PILOT MATRIX MODULE
(LOOKING AFT)

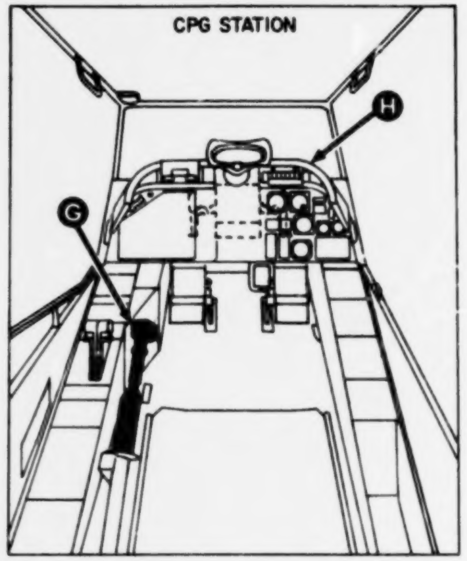


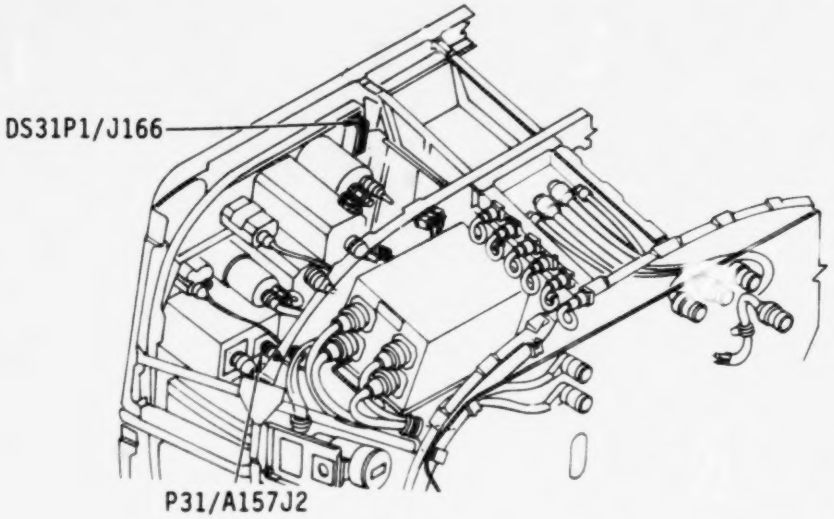
B PILOT GLARESHIELD PANEL

9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)

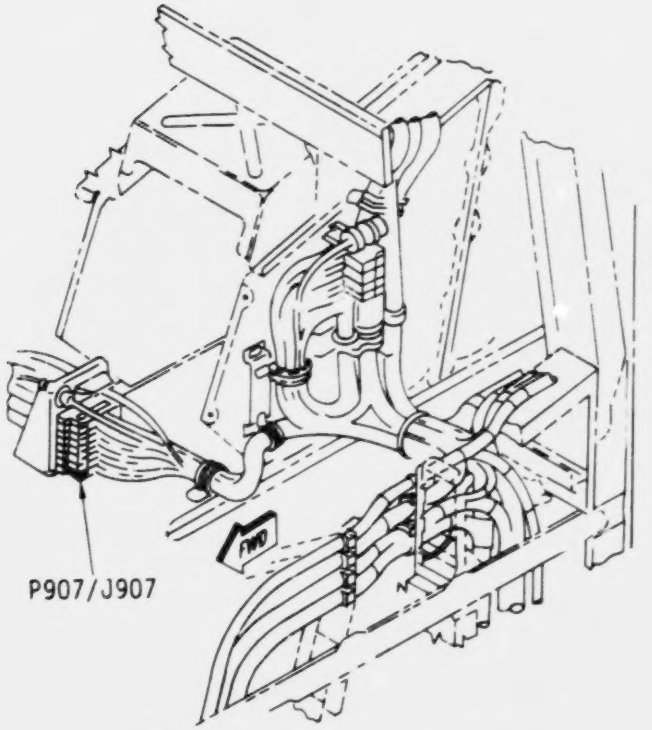


Ⓒ PILOT STATION (LEFT SIDE)

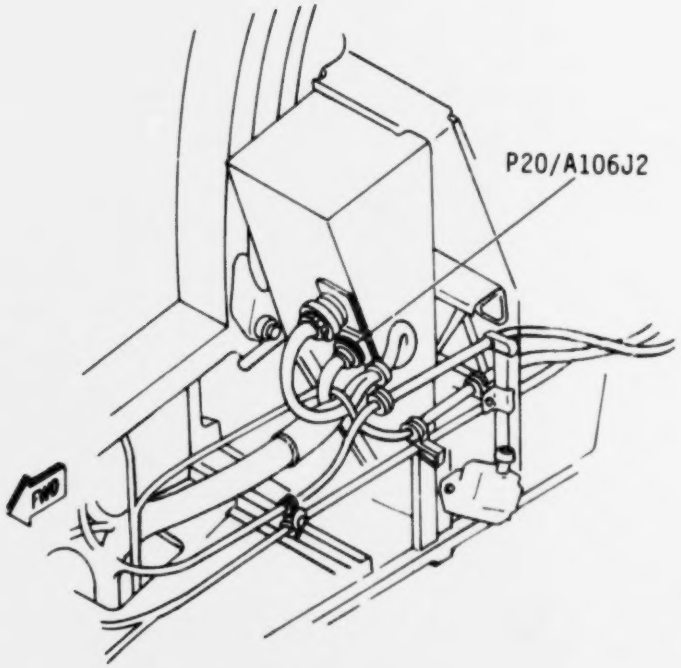




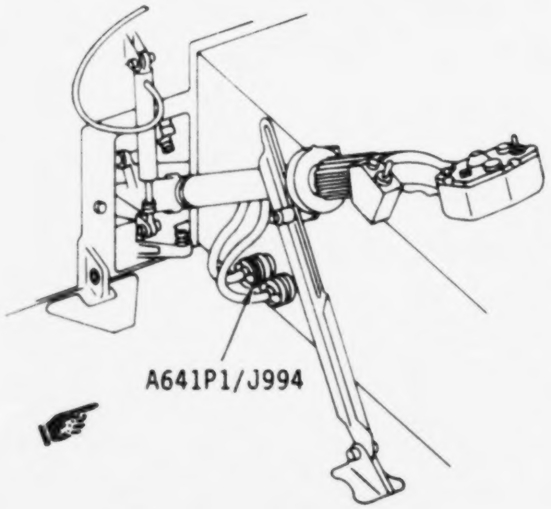
Ⓗ CPG INSTRUMENT PANEL (AFT VIEW)



Ⓕ PILOT/CPG CROSSOVER



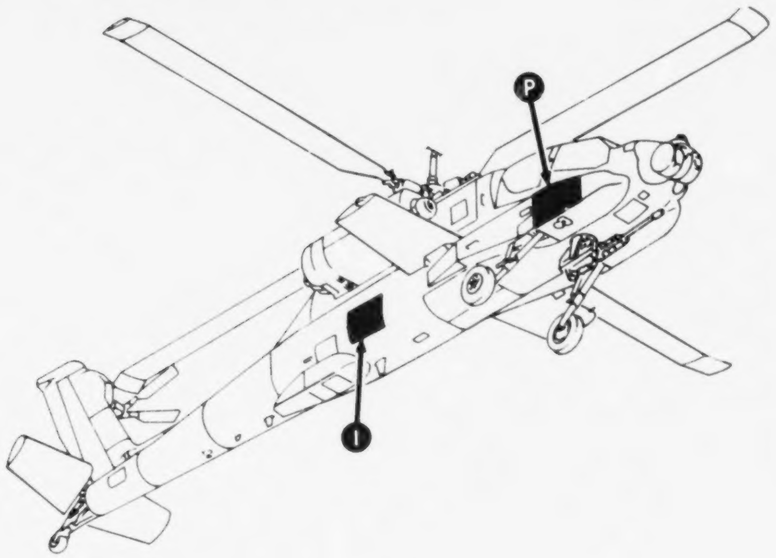
Ⓔ PILOT RIGHT SIDE CONSOLE

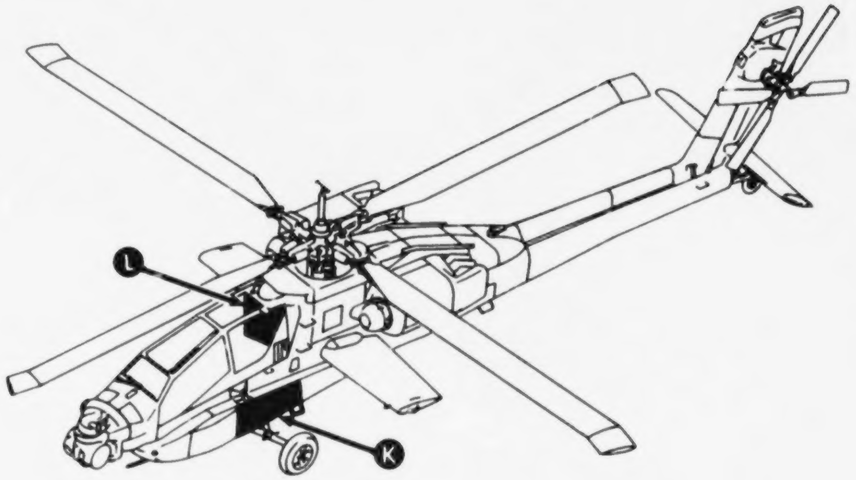


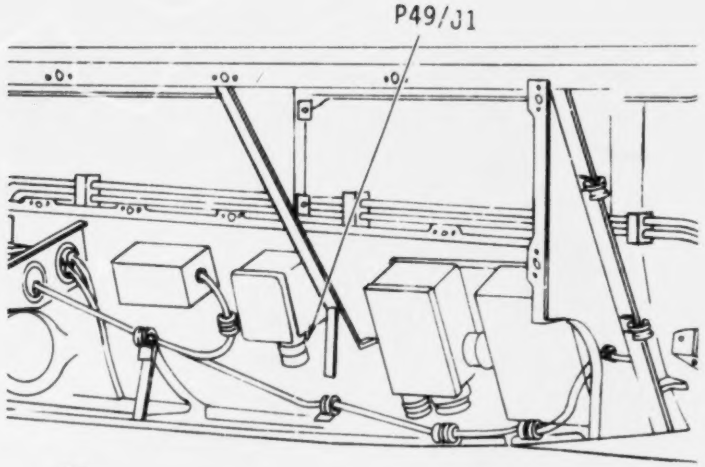
Ⓖ CPG COLLECTIVE STICK

MM04/1-1176-2C

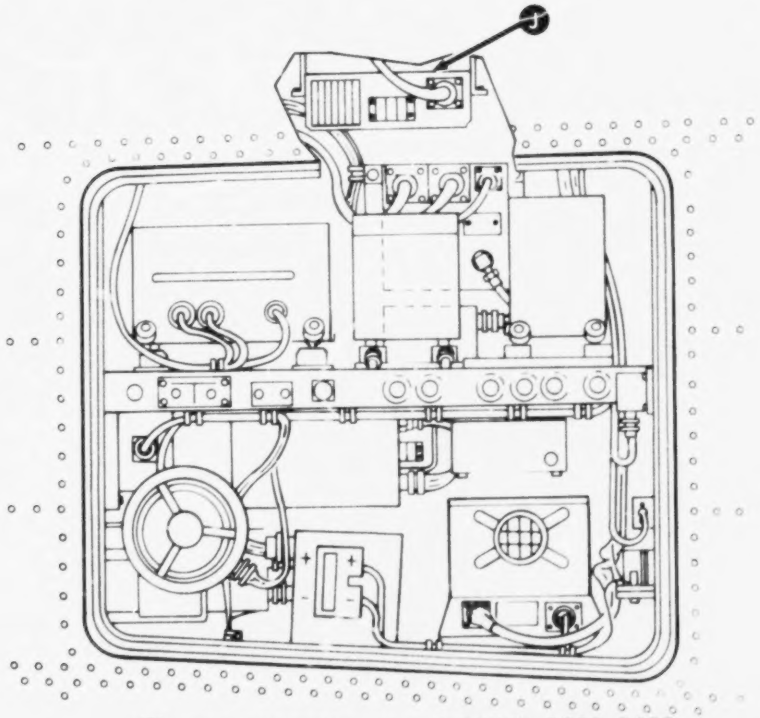
9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



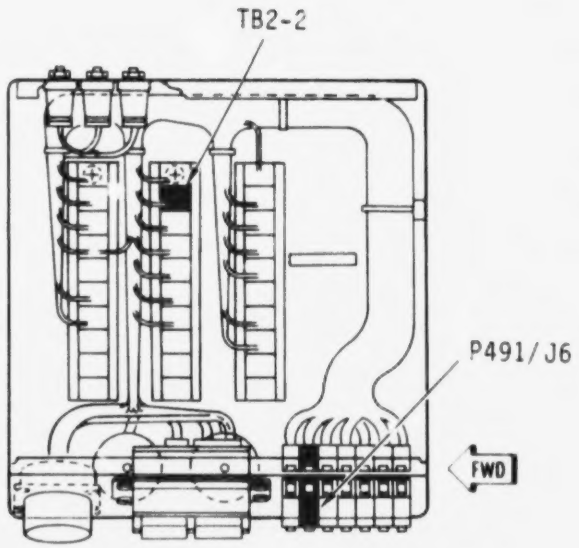




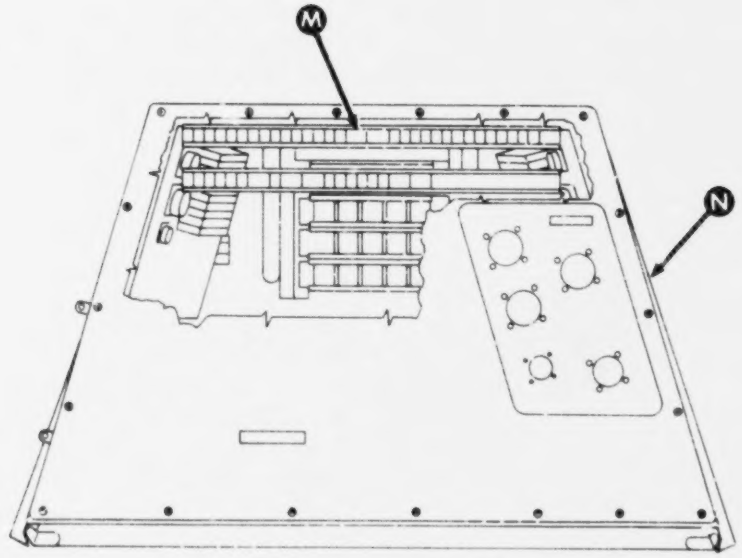
Ⓚ BELOW PILOT FLOOR THROUGH FAIRING L140



Ⓘ AFT AVIONICS BAY THROUGH DOOR R295



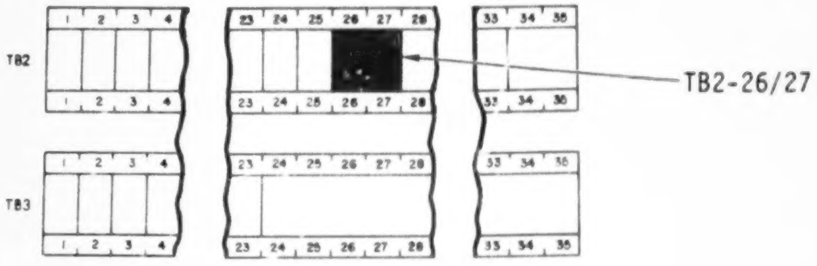
Ⓙ AFT AVIONICS MATRIX MODULE
(VIEW LOOKING UP)



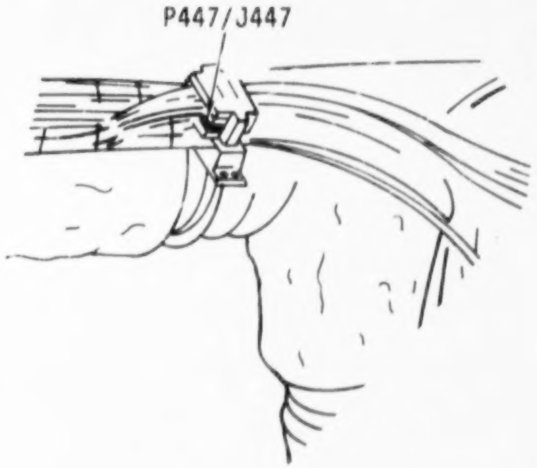
Ⓛ ELECTRICAL POWER DISTRIBUTION BOX

MM04/1-1176-3E

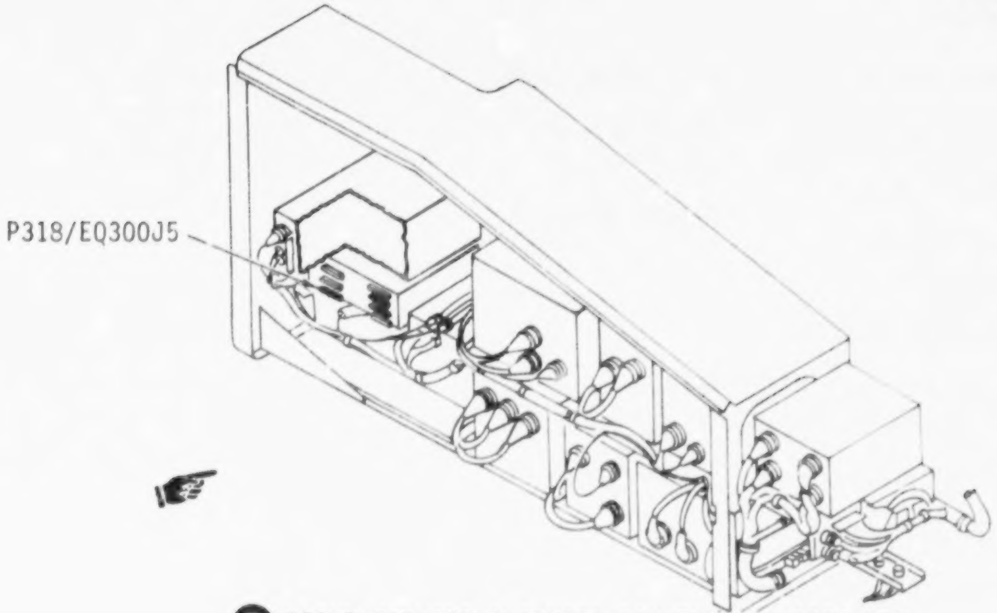
9-33-3. AUDIO WARNING SYSTEM - ELECTRICAL COMPONENT LOCATION AND CONFIGURATION (cont)



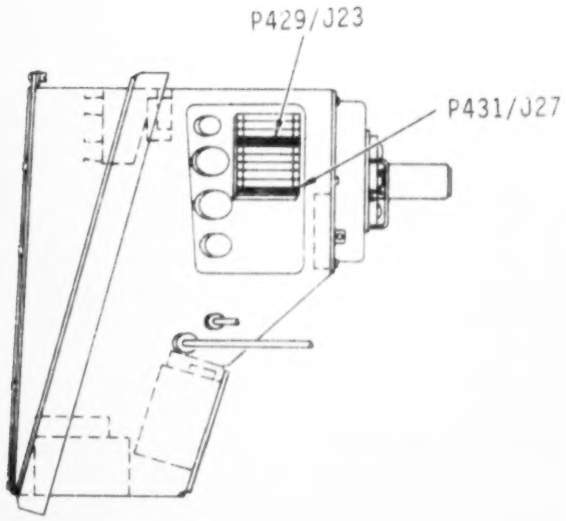
Ⓜ TERMINAL BOARDS



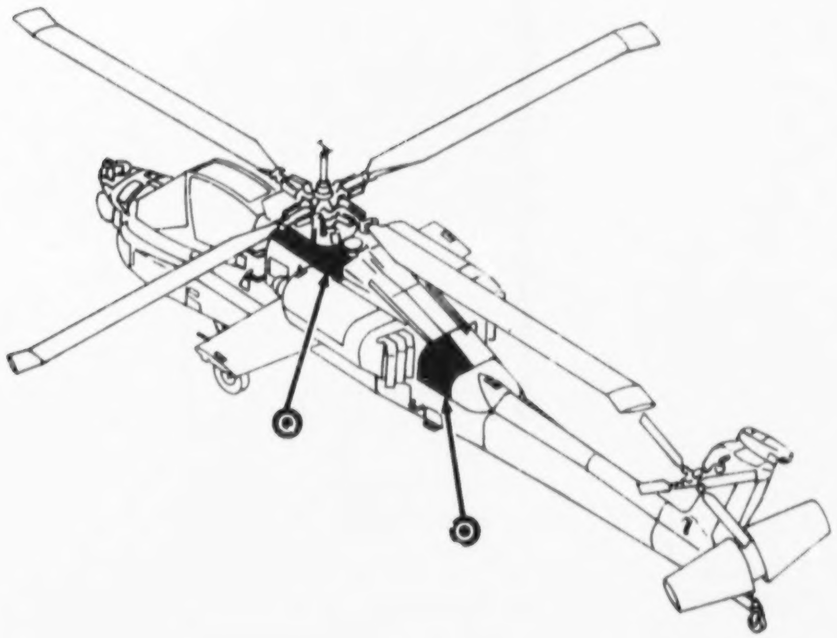
Ⓠ AFT DECK THROUGH FAIRING T205L

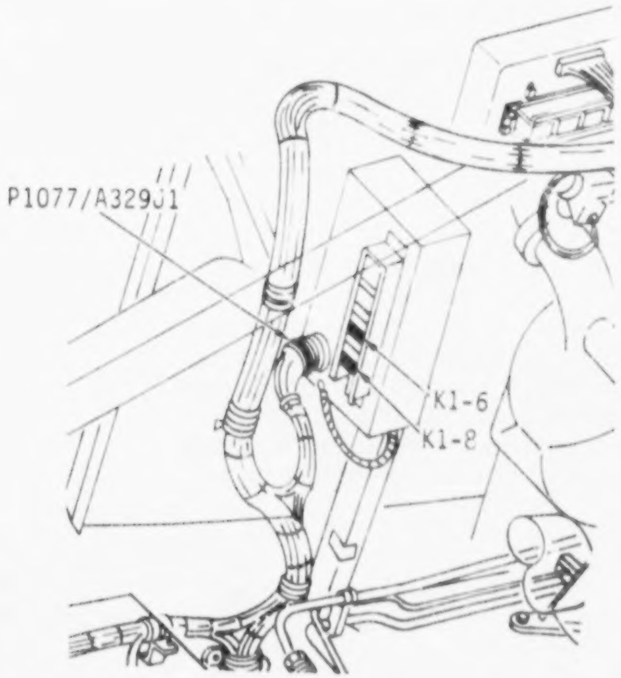


Ⓟ RIGHT FORWARD AVIONICS BAY THROUGH DOOR R90



Ⓝ LEFT SIDE VIEW (ROTATED)





Ⓞ AFT DECK THROUGH DOOR L325

MM04/1-1176-4C

9-33-4. ENG WARN CIRCUIT BREAKER (CB52) - DOES NOT STAY CLOSED

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One to assist

References:

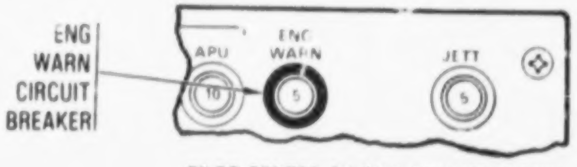
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	External power application - Electrical

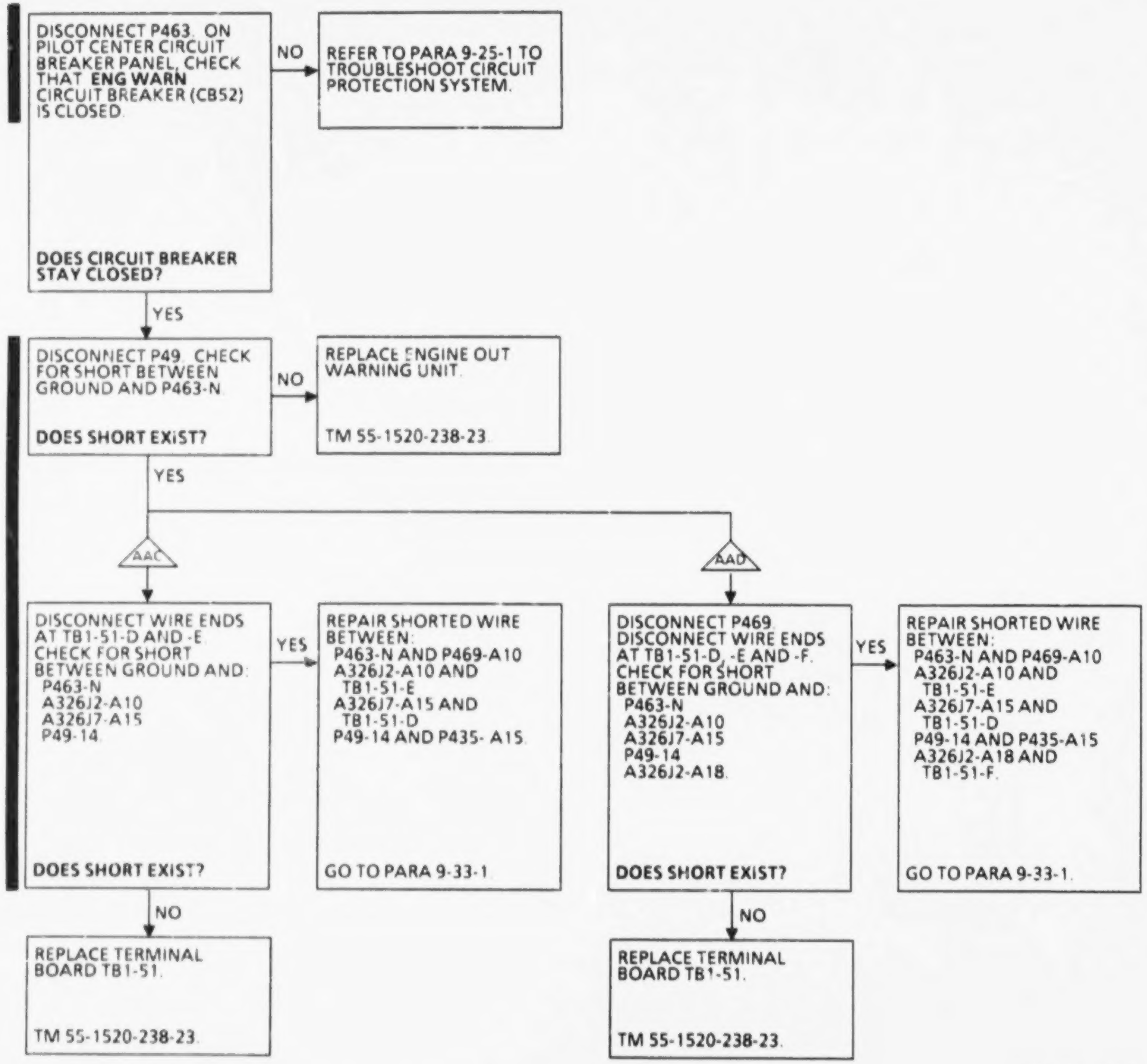
WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



PILOT CENTER CIRCUIT BREAKER PANEL

MM04/1-1196A



DISCONNECT P463. ON PILOT CENTER CIRCUIT BREAKER PANEL, CHECK THAT **ENG WARN** CIRCUIT BREAKER (CB52) IS CLOSED.

DOES CIRCUIT BREAKER STAY CLOSED?

NO: REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.

YES: DISCONNECT P49. CHECK FOR SHORT BETWEEN GROUND AND P463-N.

DOES SHORT EXIST?

NO: REPLACE ENGINE OUT WARNING UNIT.

TM 55-1520-238-23.

YES:

DISCONNECT WIRE ENDS AT TB1-51-D AND -E. CHECK FOR SHORT BETWEEN GROUND AND:
P463-N
A326J2-A10
A326J7-A15
P49-14.

DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN:
P463-N AND P469-A10
A326J2-A10 AND TB1-51-E
A326J7-A15 AND TB1-51-D
P49-14 AND P435- A15.

GO TO PARA 9-33-1.

NO: REPLACE TERMINAL BOARD TB1-51.

TM 55-1520-238-23.

DISCONNECT P469. DISCONNECT WIRE ENDS AT TB1-51-D, -E AND -F. CHECK FOR SHORT BETWEEN GROUND AND:
P463-N
A326J2-A10
A326J7-A15
P49-14
A326J2-A18.

DOES SHORT EXIST?

YES: REPAIR SHORTED WIRE BETWEEN:
P463-N AND P469-A10
A326J2-A10 AND TB1-51-E
A326J7-A15 AND TB1-51-D
P49-14 AND P435-A15
A326J2-A18 AND TB1-51-F.

GO TO PARA 9-33-1.

NO: REPLACE TERMINAL BOARD TB1-51.

TM 55-1520-238-23.

END OF TASK

9-33-5. LOW RPM ROTOR AUDIO WARNING - IS NOT HEARD IN EITHER PILOT OR CPG HEADSET

Tools: (para 9-33-4)

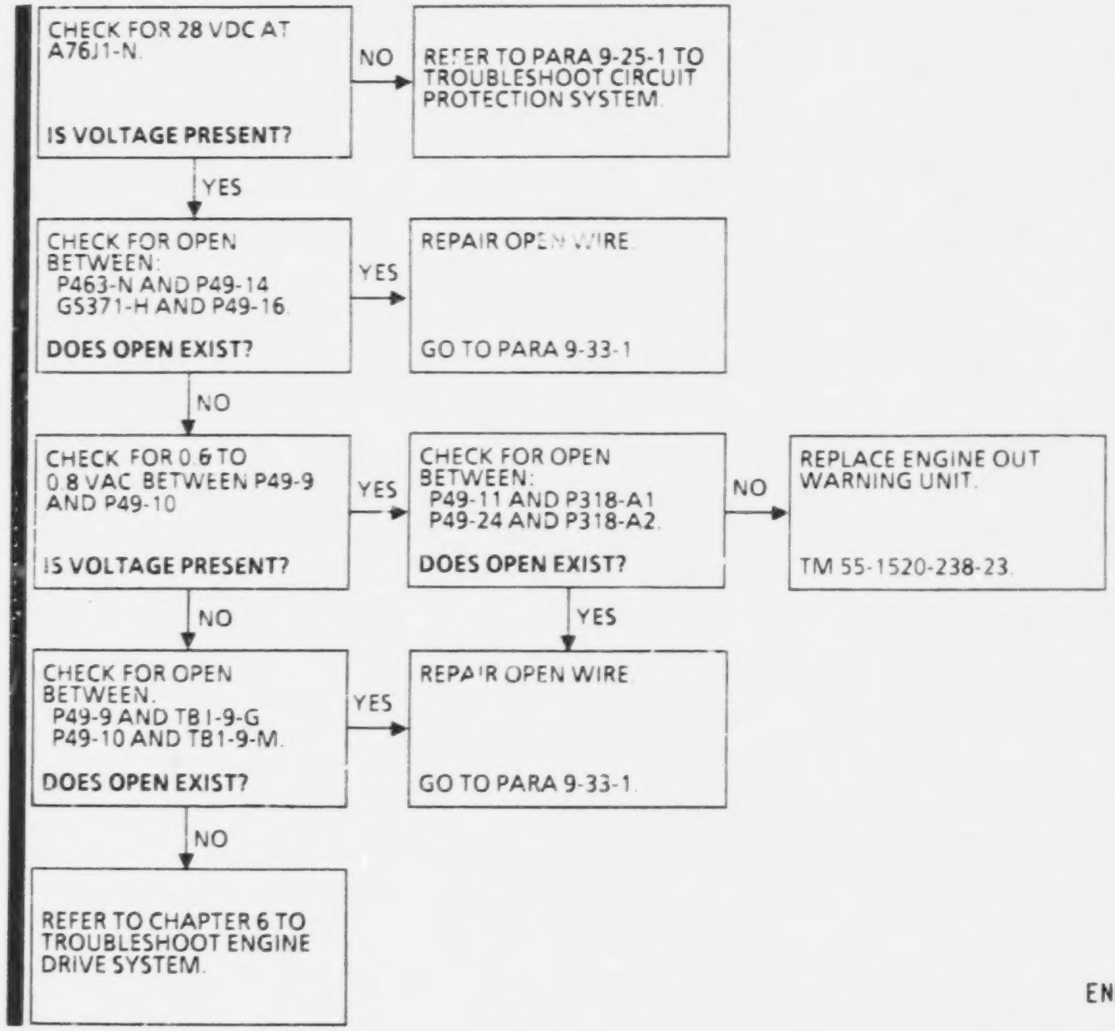
References: (para 9-33-4)

Personnel Required: (para 9-33-4)

Equipment Conditions: (para 9-33-4)

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC AT A76J1-N.
IS VOLTAGE PRESENT?
NO
REFER TO PARA 9-25-1 TO TROUBLESHOOT CIRCUIT PROTECTION SYSTEM.
YES
CHECK FOR OPEN BETWEEN: P463-N AND P49-14 GS371-H AND P49-16.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1
NO
CHECK FOR 0.6 TO 0.8 VAC BETWEEN P49-9 AND P49-10
IS VOLTAGE PRESENT?
YES
CHECK FOR OPEN BETWEEN: P49-11 AND P318-A1 P49-24 AND P318-A2.
DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN. P49-9 AND TB1-9-G P49-10 AND TB1-9-M.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
REFER TO CHAPTER 6 TO TROUBLESHOOT ENGINE DRIVE SYSTEM.

END OF TASK

9-33-6. PILOT ENGINE 1 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

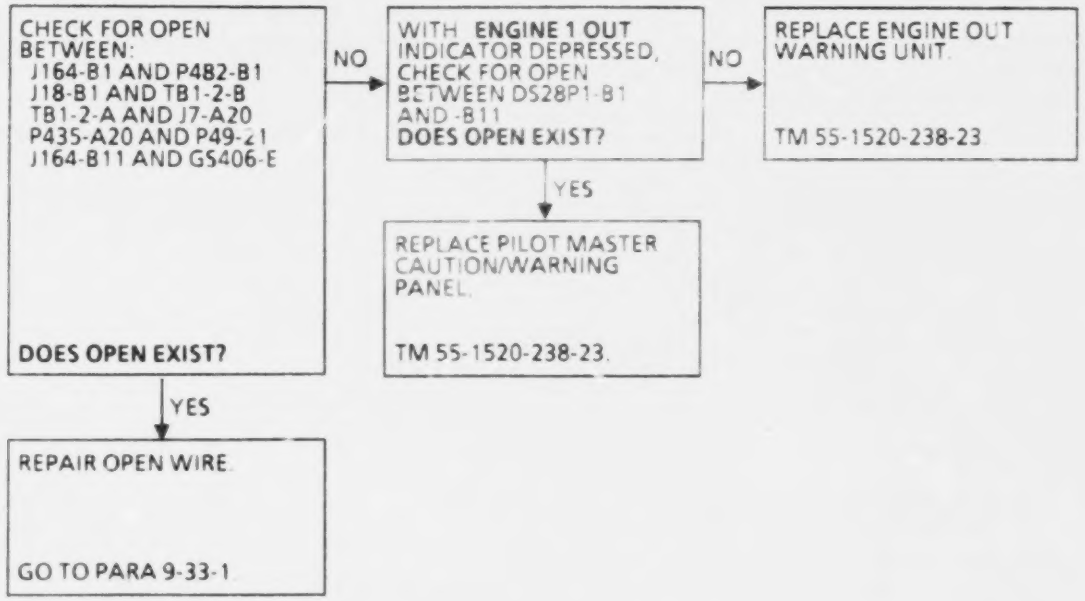
Tools: (para 9-33-4)

Personnel Required: (para 9-33-4)

References: (para 9-33-4)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter
	Nontransparent barrier removed
	Access provisions - fairing L175 removed


CHECK FOR OPEN BETWEEN: J164-B1 AND P482-B1 J18-B1 AND TB1-2-B TB1-2-A AND J7-A20 P435-A20 AND P49-21 J164-B11 AND GS406-E
DOES OPEN EXIST?
NO
WITH ENGINE 1 OUT INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS28P1-B1 AND -B11
DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1

END OF TASK

9-33-7. CPG ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH ENGINE 1 NOT RUNNING

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

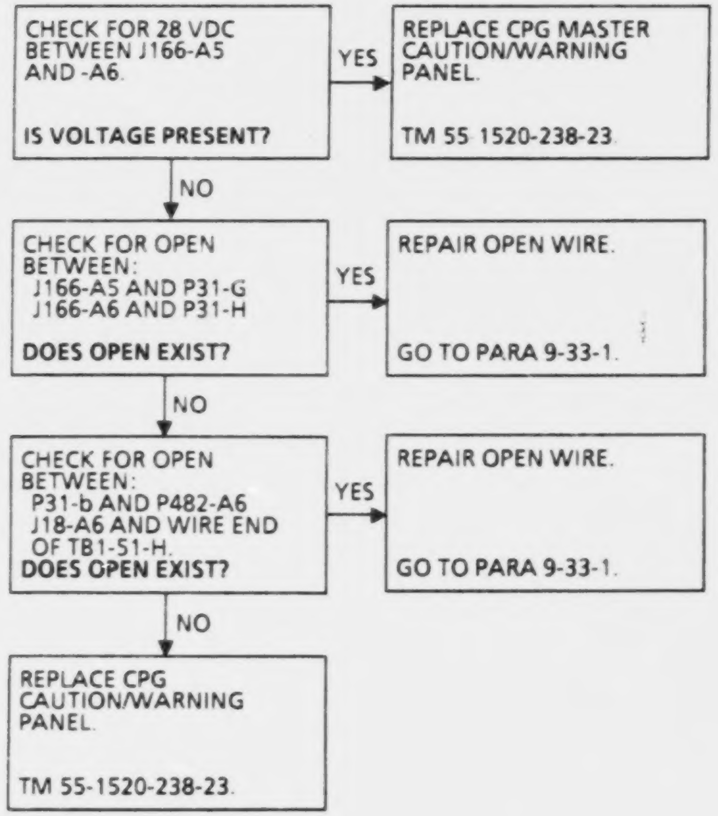
TM 55-1520-238-23

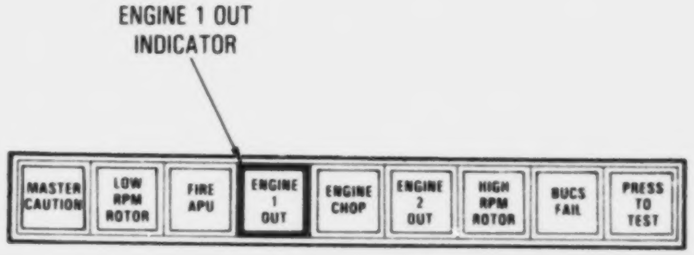
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.


CHECK FOR 28 VDC BETWEEN J166-A5 AND -A6.
IS VOLTAGE PRESENT?
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL.
TM 55 1520-238-23.
NO
CHECK FOR OPEN BETWEEN: J166-A5 AND P31-G J166-A6 AND P31-H
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P31-b AND P482-A6 J18-A6 AND WIRE END OF TB1-51-H.
DOES OPEN EXIST?
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
REPLACE CPG CAUTION/WARNING PANEL.
TM 55-1520-238-23.



MASTER CAUTION/WARNING PANEL (TYPICAL)

END OF TASK

9-33-8. PILOT ENGINE 1 OUT INDICATOR - IS NOT LIGHTED WITH ENGINE 1 NOT RUNNING

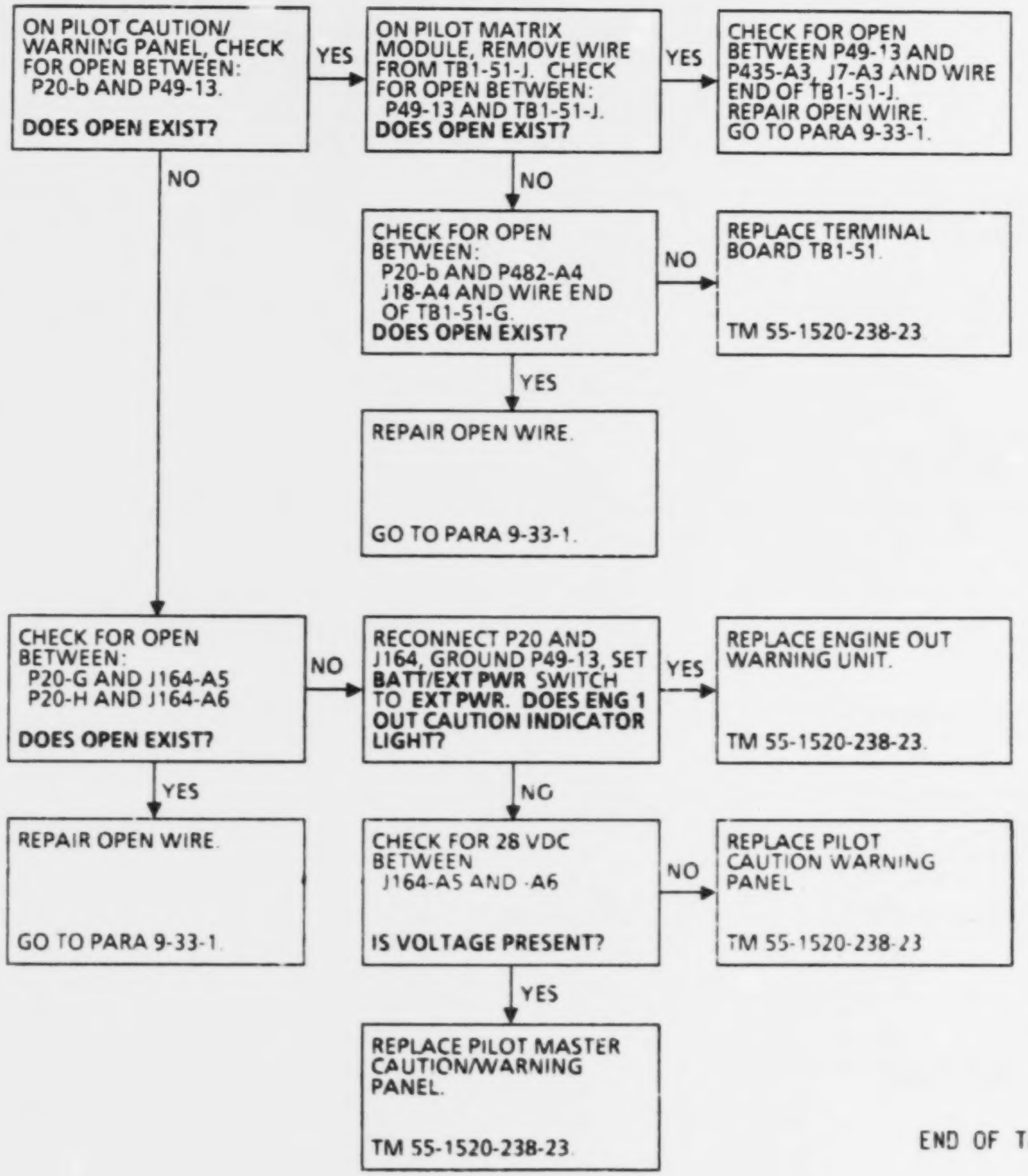
Tools: (para 9-33-7)

Personnel Required: (para 9-33-7)

References: (para 9-33-7)

Equipment Conditions: (para 9-33-7)

REFER TO VOLTAGE WARNING


ON PILOT CAUTION/ WARNING PANEL, CHECK FOR OPEN BETWEEN: P20-b AND P49-13.
DOES OPEN EXIST?
YES
ON PILOT MATRIX MODULE, REMOVE WIRE FROM TB1-51-J. CHECK FOR OPEN BETWEEN: P49-13 AND TB1-51-J.
DOES OPEN EXIST?
YES
CHECK FOR OPEN BETWEEN P49-13 AND P435-A3, J7-A3 AND WIRE END OF TB1-51-J. REPAIR OPEN WIRE. GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P20-b AND P482-A4 J18-A4 AND WIRE END OF TB1-51-G.
DOES OPEN EXIST?
NO
REPLACE TERMINAL BOARD TB1-51.
TM 55-1520-238-23
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR OPEN BETWEEN: P20-G AND J164-A5 P20-H AND J164-A6
DOES OPEN EXIST?
NO
RECONNECT P20 AND J164, GROUND P49-13, SET BATT/EXT PWR SWITCH TO EXT PWR. DOES ENG 1 OUT CAUTION INDICATOR LIGHT?
YES
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1.
NO
CHECK FOR 28 VDC BETWEEN J164-A5 AND -A6
IS VOLTAGE PRESENT?
NO
REPLACE PILOT CAUTION WARNING PANEL
TM 55-1520-238-23
YES
REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-33-9. CPG ENGINE 1 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

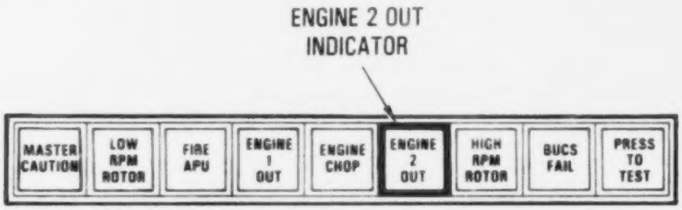
Tools: (para 9-33-7)

Personnel Required: (para 9-33-7)

References: (para 9-33-7)

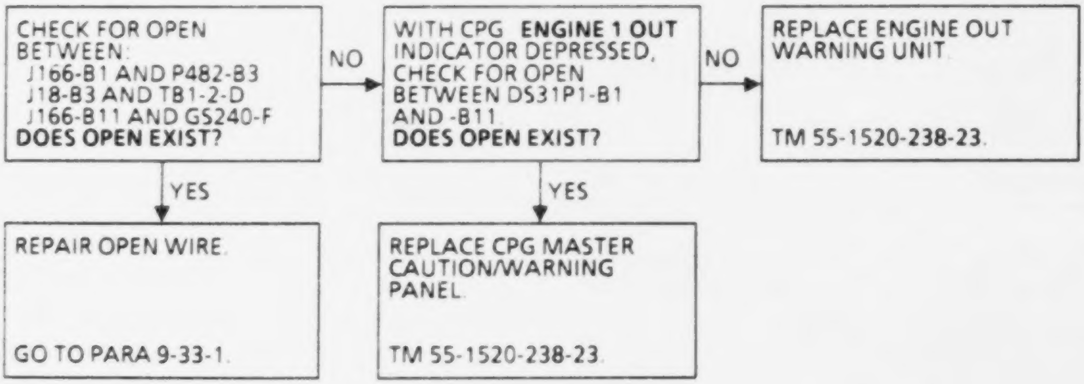
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed



MASTER CAUTION/WARNING PANEL
(TYPICAL)

MM04/1-1201


CHECK FOR OPEN BETWEEN: J166-B1 AND P482-B3 J18-B3 AND TB1-2-D J166-B11 AND GS240-F DOES OPEN EXIST?
NO
WITH CPG ENGINE 1 OUT INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS31P1-B1 AND -B11. DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23.
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
YES
REPLACE CPG MASTER CAUTION/WARNING PANEL. TM 55-1520-238-23.

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.

END OF TASK

9-33-10. PILOT ENGINE 2 OUT INDICATOR - IS NOT LIGHTED WITH ENGINE 2 NOT RUNNING

Tools: (para 9-33-7)

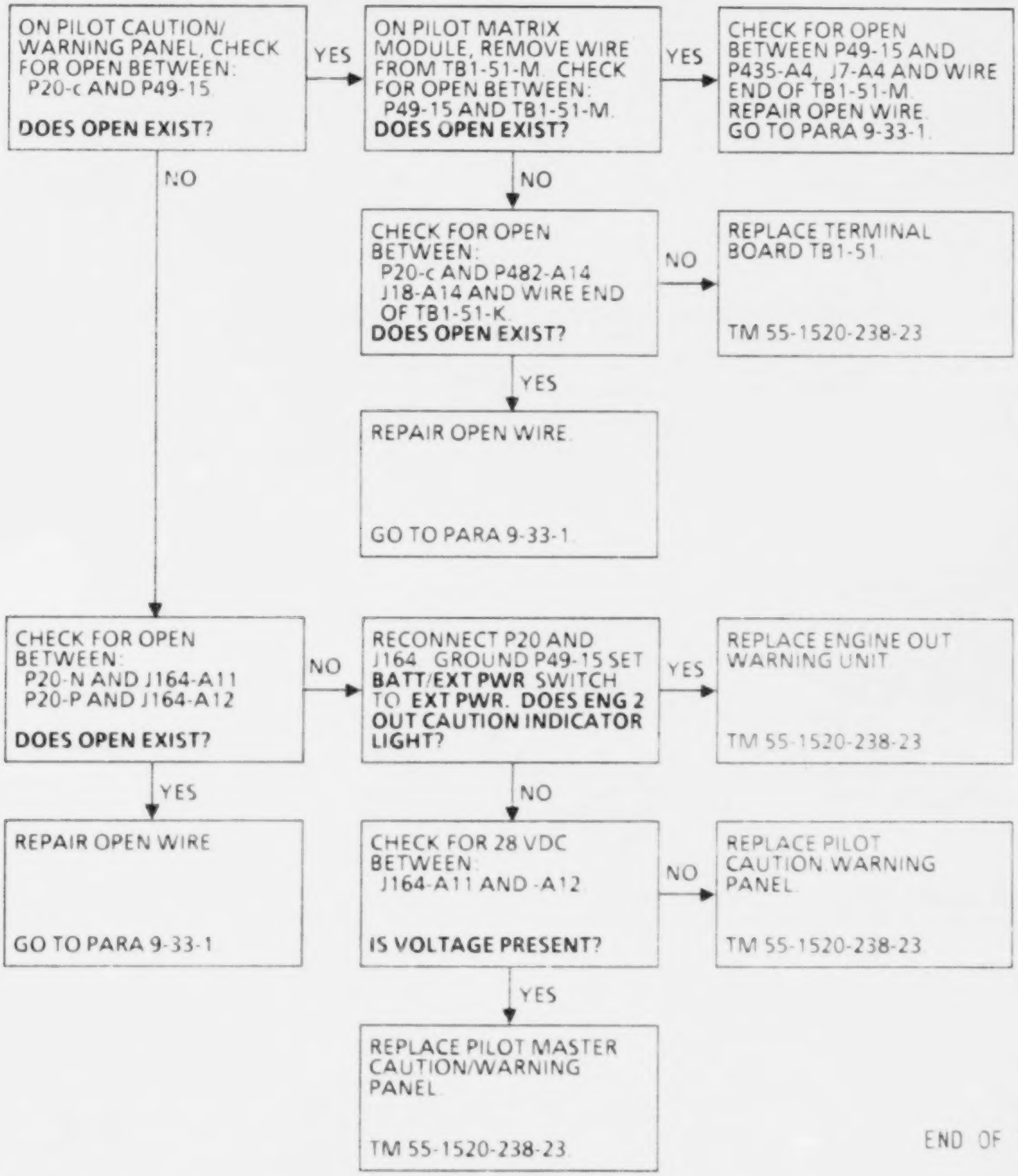
Personnel Required: (para 9-33-7)

References: (para 9-33-7)

REFER TO VOLTAGE WARNING

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed Access provisions - L175 fairing removed



ON PILOT CAUTION/ WARNING PANEL, CHECK FOR OPEN BETWEEN:
P20-c AND P49-15.
DOES OPEN EXIST?

ON PILOT MATRIX MODULE, REMOVE WIRE FROM TB1-51-M. CHECK FOR OPEN BETWEEN:
P49-15 AND TB1-51-M.
DOES OPEN EXIST?

CHECK FOR OPEN BETWEEN P49-15 AND P435-A4, J7-A4 AND WIRE END OF TB1-51-M. REPAIR OPEN WIRE. GO TO PARA 9-33-1.

CHECK FOR OPEN BETWEEN:
P20-c AND P482-A14
J18-A14 AND WIRE END OF TB1-51-K.
DOES OPEN EXIST?

REPLACE TERMINAL BOARD TB1-51.
TM 55-1520-238-23

REPAIR OPEN WIRE.
GO TO PARA 9-33-1.

CHECK FOR OPEN BETWEEN:
P20-N AND J164-A11
P20-P AND J164-A12
DOES OPEN EXIST?

RECONNECT P20 AND J164. GROUND P49-15 SET **BATT/EXT PWR** SWITCH TO **EXT PWR. DOES ENG 2 OUT CAUTION INDICATOR LIGHT?**

REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23

REPAIR OPEN WIRE.
GO TO PARA 9-33-1.

CHECK FOR 28 VDC BETWEEN:
J164-A11 AND -A12.
IS VOLTAGE PRESENT?

REPLACE PILOT CAUTION WARNING PANEL.
TM 55-1520-238-23.

REPLACE PILOT MASTER CAUTION/WARNING PANEL.
TM 55-1520-238-23.

END OF TASK

9-33-11. PILOT ENGINE 2 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

Tools:

Nomenclature	Part Number (NSN)
Multimeter, AN/URM-105C	6625-00-999-6282
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

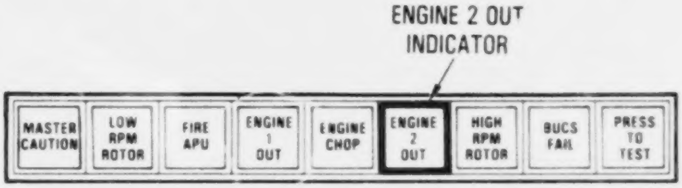
68F10	Aircraft Electrician One person to assist

References:

TM 55-1520-238-23

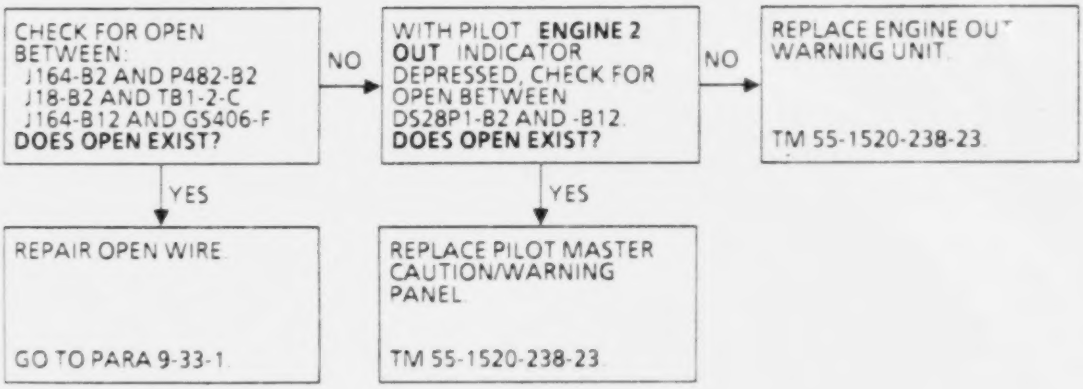
Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Nontransparent barrier removed



MASTER CAUTION/WARNING PANEL
(TYPICAL)

MM04/1-1201


CHECK FOR OPEN BETWEEN:
J164-B2 AND P482-B2
J18-B2 AND TB1-2-C
J164-B12 AND GS406-F
DOES OPEN EXIST?

REPAIR OPEN WIRE.

GO TO PARA 9-33-1.

WITH PILOT **ENGINE 2 OUT** INDICATOR DEPRESSED, CHECK FOR OPEN BETWEEN DS28P1-B2 AND -B12.
DOES OPEN EXIST?

REPLACE PILOT MASTER CAUTION/WARNING PANEL.

TM 55-1520-238-23.

REPLACE ENGINE OUT WARNING UNIT.

TM 55-1520-238-23.

END OF TASK

9-33-12. CPG ENGINE 2 INDICATOR - IS NOT LIGHTED WITH ENGINE 2 NOT RUNNING

Tools: (para 9-33-11)

Personnel Required: (para 9-33-11)

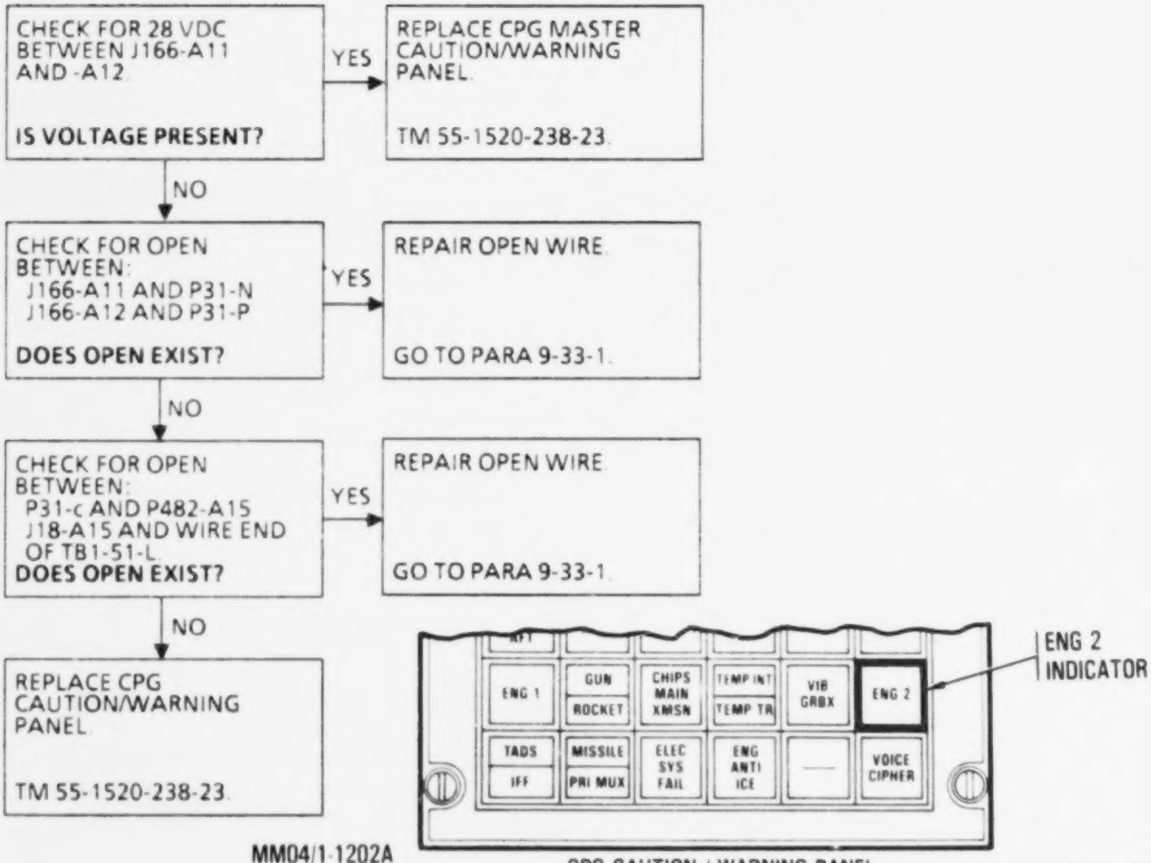
References: (para 9-33-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
Para 9-5-2	EXTERNAL POWER - POWER UP completed

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



MM04/1-1202A

CPG CAUTION / WARNING PANEL

END OF TASK

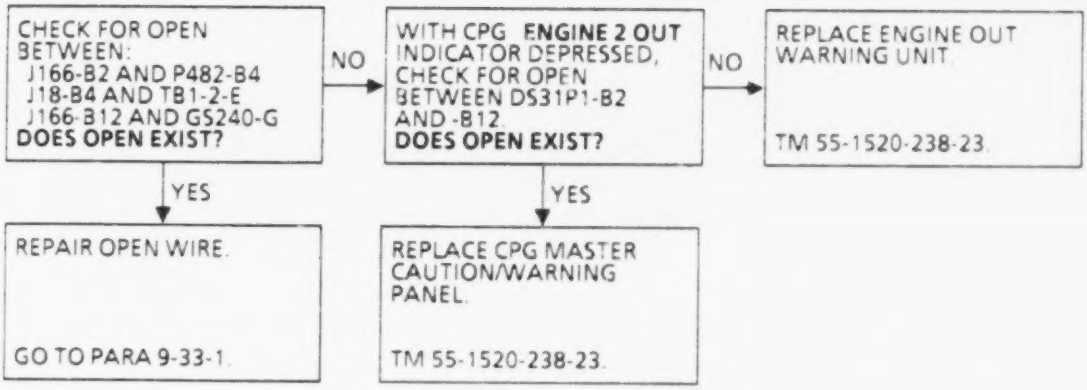
9-33-13. CPG ENGINE 2 OUT INDICATOR - DOES NOT RESET AUDIO WARNING

Tools: (para 9-33-11)

Personnel Required: (para 9-33-11)

References: (para 9-33-11)

Equipment Conditions: (para 9-33-11)



END OF TASK

9-33-14. STABILATOR AUDIO WARNING - IS NOT HEARD IN EITHER PILOT OR CPG HEADSET

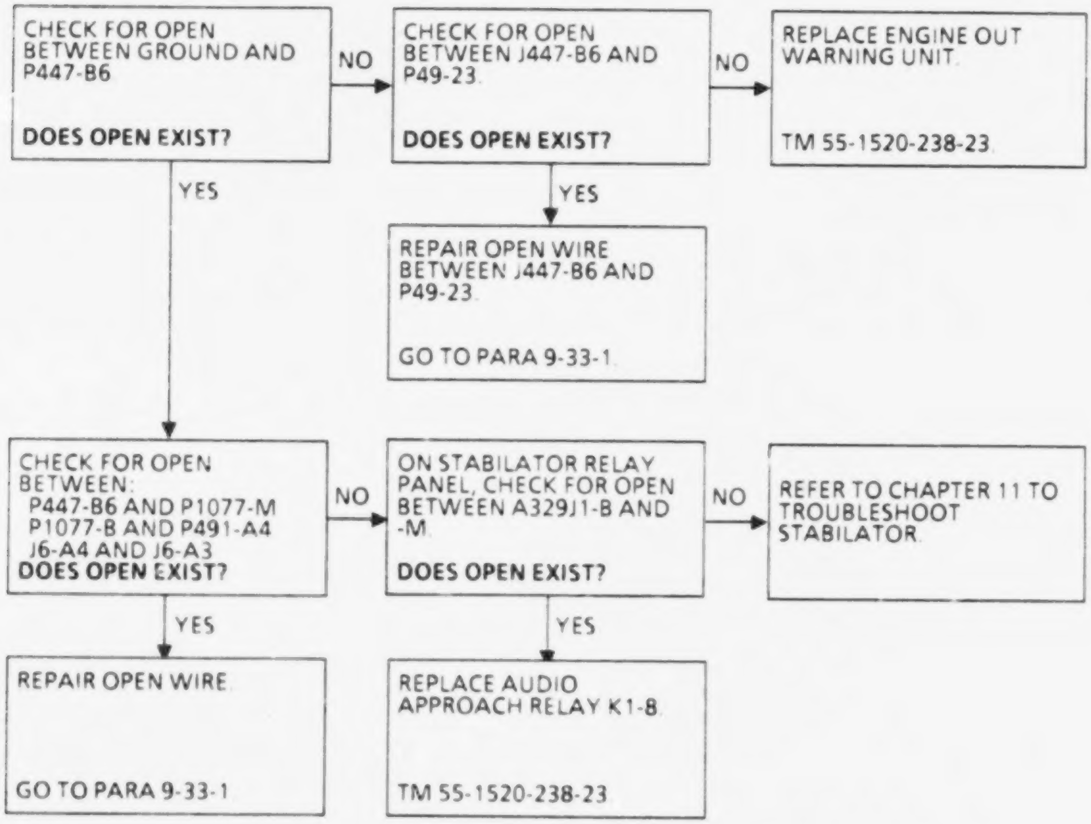
Tools: (para 9-33-11)

Personnel Required: (para 9-33-11)

References: (para 9-33-11)

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	L200 panel removed


CHECK FOR OPEN BETWEEN GROUND AND P447-B6.
DOES OPEN EXIST?
NO
CHECK FOR OPEN BETWEEN J447-B6 AND P49-23.
DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT.
TM 55-1520-238-23.
YES
YES
REPAIR OPEN WIRE BETWEEN J447-B6 AND P49-23.
GO TO PARA 9-33-1.
CHECK FOR OPEN BETWEEN: P447-B6 AND P1077-M P1077-B AND P491-A4 J6-A4 AND J6-A3
DOES OPEN EXIST?
NO
ON STABILATOR RELAY PANEL, CHECK FOR OPEN BETWEEN A329J1-B AND -M.
DOES OPEN EXIST?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR.
YES
YES
REPAIR OPEN WIRE.
GO TO PARA 9-33-1
REPLACE AUDIO APPROACH RELAY K1-8.
TM 55-1520-238-23

END OF TASK

9-33-15. PILOT RESET BUTTON - DOES NOT RESET STABILATOR AUDIO WARNING

Tools:

Nomenclature	Part Number (NSN)
Multimeter, Digital AN/PSM-45	6625-01-139-2512
Tool Kit, Electrical Repairer	5180-00-323-4915

Personnel Required:

68F10 Aircraft Electrician
One person to assist

References:

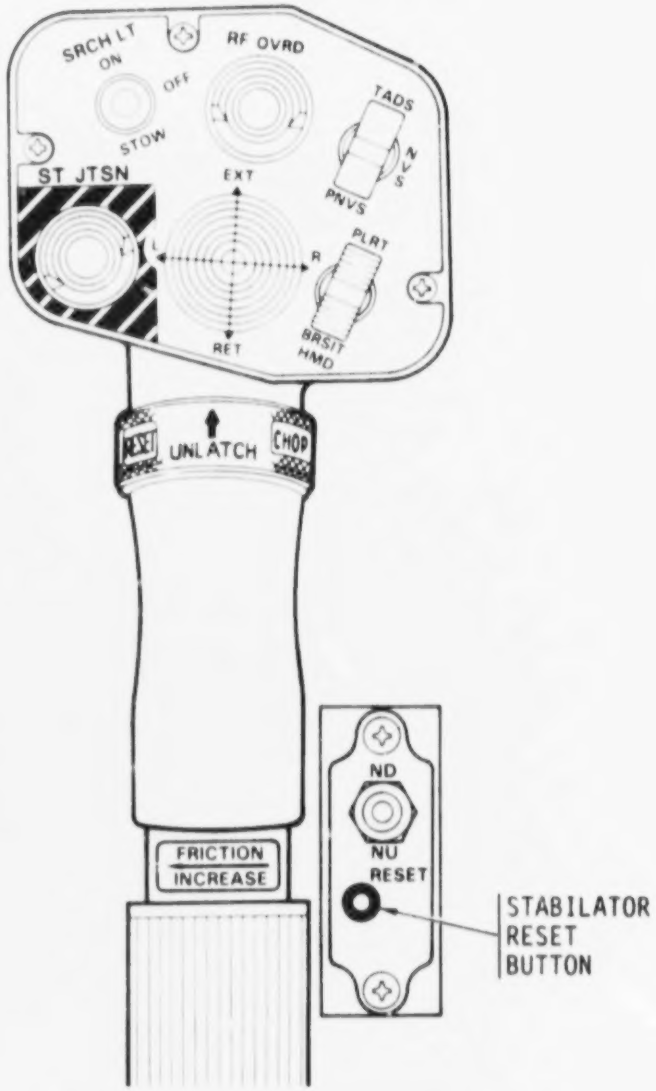
TM 55-1520-238-23

Equipment Conditions:

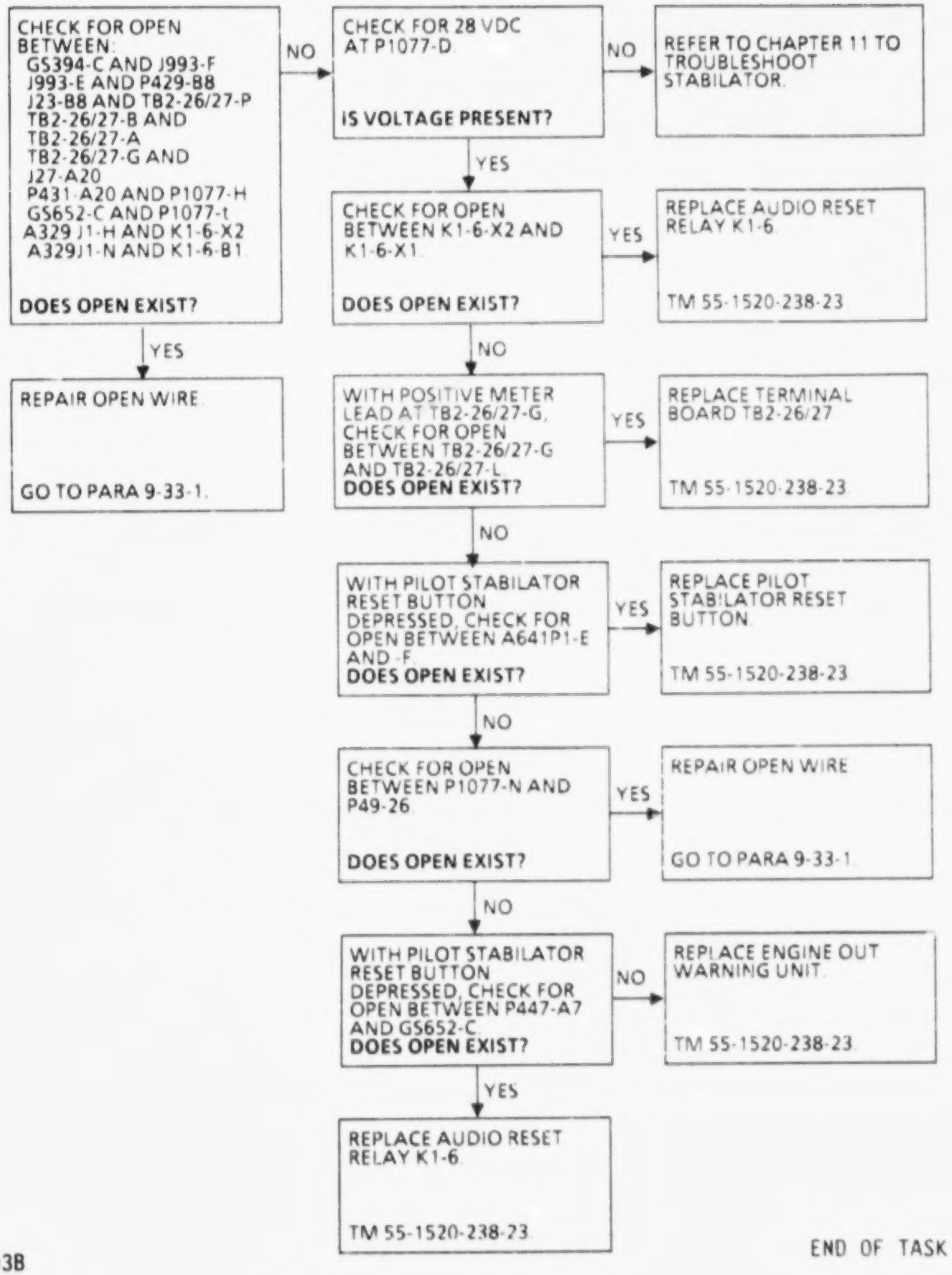
Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
	Nontransparent barrier removed
	Access provisions - L200 panel removed L325, T290R and T290L doors opened
	External power application - Electrical

WARNING

Turn off power before disconnecting or reconnecting wires and connectors. High current 28 VDC and/or 115 VAC are present. Failure to do so could result in death or serious injury.



COLLECTIVE STICK (TYPICAL)


CHECK FOR OPEN BETWEEN: GS394-C AND J993-F J993-E AND P429-B8 J23-B8 AND TB2-26/27-P TB2-26/27-B AND TB2-26/27-A TB2-26/27-G AND J27-A20 P431-A20 AND P1077-H GS652-C AND P1077-t A329 J1-H AND K1-6-X2 A329J1-N AND K1-6-B1. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
NO
CHECK FOR 28 VDC AT P1077-D. IS VOLTAGE PRESENT?
NO
REFER TO CHAPTER 11 TO TROUBLESHOOT STABILATOR.
YES
CHECK FOR OPEN BETWEEN K1-6-X2 AND K1-6-X1. DOES OPEN EXIST?
YES
REPLACE AUDIO RESET RELAY K1-6. TM 55-1520-238-23
NO
WITH POSITIVE METER LEAD AT TB2-26/27-G, CHECK FOR OPEN BETWEEN TB2-26/27-G AND TB2-26/27-L. DOES OPEN EXIST?
YES
REPLACE TERMINAL BOARD TB2-26/27. TM 55-1520-238-23
NO
WITH PILOT STABILATOR RESET BUTTON DEPRESSED, CHECK FOR OPEN BETWEEN A641P1-E AND -F. DOES OPEN EXIST?
YES
REPLACE PILOT STABILATOR RESET BUTTON. TM 55-1520-238-23
NO
CHECK FOR OPEN BETWEEN P1077-N AND P49-26. DOES OPEN EXIST?
YES
REPAIR OPEN WIRE. GO TO PARA 9-33-1.
NO
WITH PILOT STABILATOR RESET BUTTON DEPRESSED, CHECK FOR OPEN BETWEEN P447-A7 AND GS652-C. DOES OPEN EXIST?
NO
REPLACE ENGINE OUT WARNING UNIT. TM 55-1520-238-23
YES
REPLACE AUDIO RESET RELAY K1-6. TM 55-1520-238-23

MM04/1-1203B

END OF TASK

9-33-16. CPG RESET BUTTON - DOES NOT RESET STABILATOR AUDIO WARNING

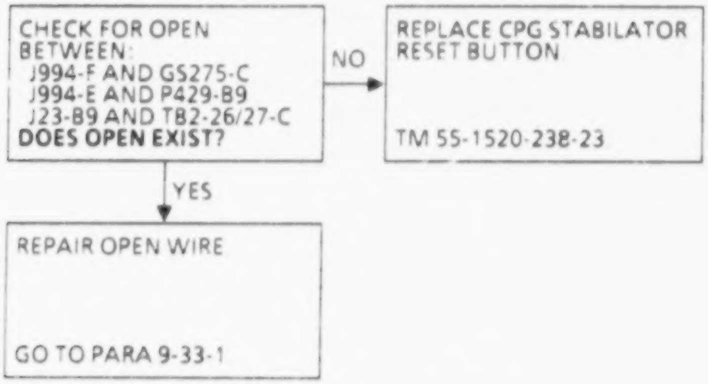
Tools: (para 9-33-15)

Personnel Required: (para 9-33-15)

References: (para 9-33-15)

Equipment Conditions

Ref	Condition
TM 55-1520-238-23	Helicopter safed
	Electrical power center cover removed
	Access provisions - L200 panel removed



9-33-17. FALSE ENGINE OUT WARNING OCCURS INFLIGHT (SINGLE ENGINE MANEUVER AT HIGH POWER SETTING AND Np LESS THAN 89%)

Tools:

Nomenclature	Part Number (NSN)
Tool Kit, Aircraft Mechanics	5180-00-323-4692
Tool Kit, Electrical Repairer's	5180-00-323-4915
Multimeter AN/URM-105C	6625-00-999-6282

Personnel Required:

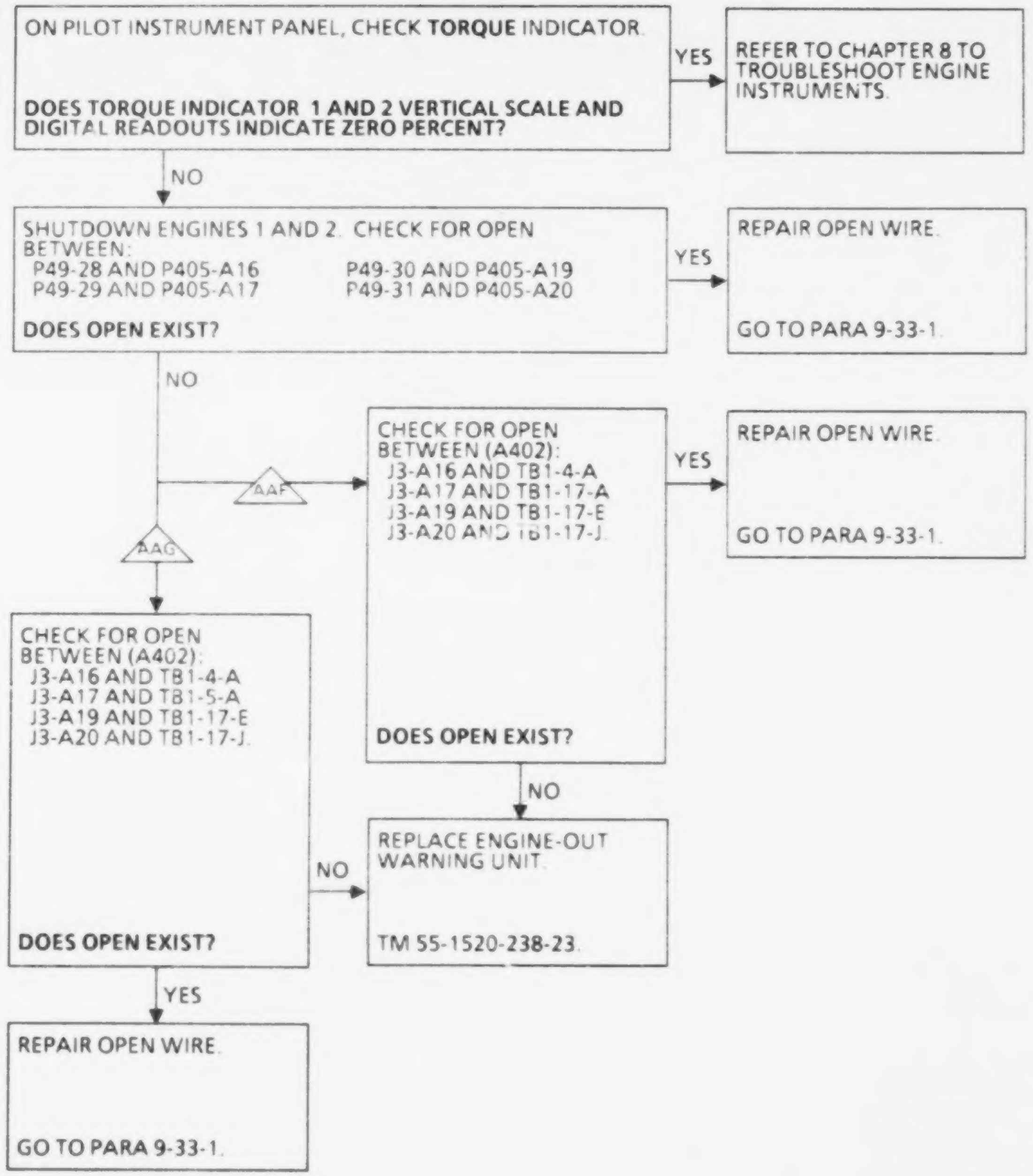
67R10 Attack Helicopter Repairer
68F10 Aircraft Electrician
100KG Pilot

References:

TM 55-1520-238-CL
TM 55-1520-238-23

Equipment Conditions:

Ref	Condition
TM 55-1520-238-23	Helicopter Safed
TM 55-1520-238-CL	No. 1 and No. 2 engines running
Para 1-3-2	ICS connected



9-33-1.

END OF TASK

* U.S. GOVERNMENT PRINTING OFFICE : 1990 0 - 273-299

By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

MILDRED E. HEDBERG
Brigadier General, United States Army
The Adjutant General

DISTRIBUTION:
To be distributed in accordance with DA Form 12-31, AVUM and AVIM requirements for AH-64A Helicopter, Attack (APACHE).

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN... JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)
PFC JOHN DOE
COA, 3d ENGINEER BN
FT. LEONARDWOOD, MO 63108

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-1520-238-T-2	15 Dec 85	AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
6	2-1 a			In line 6 of paragraph 2-1a the manual states the engine has 6 Cylinders. The engine on my set only has 4 Cylin d. Change the manual to show 4 Cylinders.
81		4-3		Callout 16 on figure 4-3 is pointing at a bolt. In key to figure 4-3, item 16 is called a shim - Please correct one or the other.
125	line 20			I ordered a gasket, item 19 on figure B-16 by NSN 2910-00-762-3001. I got a gasket but it doesn't fit. Supply says I got What I ordered, so the NSN is wrong. Please give me a good NSN

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE
JOHN DOE, PFC (268) 317-7111	John Doe JOHN DOE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 1, 1 Nov 80

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM. CAREFULLY TEAR IT OUT. FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER TM 55-1520-238-T-2	PUBLICATION DATE 15 Dec 85	PUBLICATION TITLE AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO

IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

PRINTED NAME, GRADE OR TITLE, AND TELEPHONE NUMBER

SIGN HERE

TEAR ALONG PERFORATED LINE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

TEAR ALONG PERFORATED LINE

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-1520-238-T-2	15 Dec 85	AVUM and AVIM Trouble-shooting Manual for Army Model AH-64A Helicopter

BE EXACT PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

DA FORM 1 JUL 79 2028-2

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

TEAR ALONG PERFORATED LINE

TEAR ALONG PERFORATED LINE

RECOMMENDED CHANGES TO EQUIPMENT TECHNICAL PUBLICATIONS

THEN. . JOT DOWN THE DOPE ABOUT IT ON THIS FORM, CAREFULLY TEAR IT OUT, FOLD IT AND DROP IT IN THE MAIL!

SOMETHING WRONG WITH THIS PUBLICATION?

FROM: (PRINT YOUR UNIT'S COMPLETE ADDRESS)

DATE SENT

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 55-1520-238-T-2	15 Dec 85	AVUM and AVIM Troubleshooting Manual for Army Model AH-64A Helicopter

BE EXACT PIN-POINT WHERE IT IS				IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
PAGE NO	PARA-GRAPH	FIGURE NO	TABLE NO	

PRINTED NAME, GRADE OR TITLE AND TELEPHONE NUMBER	SIGN HERE

DA FORM 1 JUL 79 **2028-2**

PREVIOUS EDITIONS ARE OBSOLETE.

DRSTS-M Overprint 2, 1 Nov 80.

P.S.--IF YOUR OUTFIT WANTS TO KNOW ABOUT YOUR RECOMMENDATION MAKE A CARBON COPY OF THIS AND GIVE IT TO YOUR HEADQUARTERS

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

TEAR ALONG PERFORATED LINE

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

U.S. MAIL

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

REVERSE OF DA FORM 2028-2 Reverse of DRSTS-M Overprint 2,
1 Nov 80

FILL IN YOUR
UNIT'S ADDRESS

FOLD BACK

DEPARTMENT OF THE ARMY

____

____

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE $300

POSTAGE AND FEES PAID
DEPARTMENT OF THE ARMY
DOD 314

COMMANDER
U S ARMY AVIATION SYSTEMS COMMAND
ATTN: AMSAV-MPSD
4300 GOODFELLOW BOULEVARD
ST. LOUIS, MO 63120-1798

TEAR ALONG PERFORATED LINE

The Metric System and Equivalents

Linear Measure

1 centimeter = 10 millimeters = .39 inch
1 decimeter = 10 centimeters = 3.94 inches
1 meter = 10 decimeters = 39.37 inches
1 dekameter = 10 meters = 32.8 feet
1 hectometer = 10 dekameters = 328.08 feet
1 kilometer = 10 hectometers = 3,280.8 feet

Weights

1 centigram = 10 milligrams = .15 grain
1 decigram = 10 centigrams = 1.54 grains
1 gram = 10 decigram = .035 ounce
1 dekagram = 10 grams = .35 ounce
1 hectogram = 10 dekagrams = 3.52 ounces
1 kilogram = 10 hectograms = 2.2 pounds
1 quintal = 100 kilograms = 220.46 pounds
1 metric ton = 10 quintals = 1.1 short tons

Liquid Measure

1 centiliter = 10 milliters = .34 fl. ounce
1 deciliter = 10 centiliters = 3.38 fl. ounces
1 liter = 10 deciliters = 33.81 fl. ounces
1 dekaliter = 10 liters = 2.64 gallons
1 hectoliter = 10 dekaliters = 26.42 gallons
1 kiloliter = 10 hectoliters = 264.18 gallons

Square Measure

1 sq. centimeter = 100 sq. millimeters = .155 sq. inch
1 sq. decimeter = 100 sq. centimeters = 15.5 sq. inches
1 sq. meter (centare) = 100 sq. decimeters = 10.76 sq. feet
1 sq. dekameter (are) = 100 sq. meters = 1,076.4 sq. feet
1 sq. hectometer (hectare) = 100 sq. dekameters = 2.47 acres
1 sq. kilometer = 100 sq. hectometers = .386 sq. mile

Cubic Measure

1 cu. centimeter = 1000 cu. millimeters = .06 cu. inch
1 cu. decimeter = 1000 cu. centimeters = 61.02 cu. inches
1 cu. meter = 1000 cu. decimeters = 35.31 cu. feet

Approximate Conversion Factors

To change	*To*	*Multiply by*	*To change*	*To*	*Multiply by*
inches	centimeters	2.540	ounce-inches	newton-meters	.007062
feet	meters	.305	centimeters	inches	.394
yards	meters	.914	meters	feet	3.280
miles	kilometers	1.609	meters	yards	1.094
square inches	square centimeters	6.451	kilometers	miles	.621
square feet	square meters	.093	square centimeters	square inches	.155
square yards	square meters	.836	square meters	square feet	10.764
square miles	square kilometers	2.590	square meters	square yards	1.196
acres	square hectometers	.405	square kilometers	square miles	.386
cubic feet	cubic meters	.028	square hectometers	acres	2.471
cubic yards	cubic meters	.765	cubic meters	cubic feet	35.315
fluid ounces	milliliters	29.573	cubic meters	cubic yards	1.308
pints	liters	.473	milliliters	fluid ounces	.034
quarts	liters	.946	liters	pints	2.113
gallons	liters	3.785	liters	quarts	1.057
ounces	grams	28.349	liters	gallons	.264
pounds	kilograms	.454	grams	ounces	.035
short tons	metric tons	.907	kilograms	pounds	2.205
pound-feet	newton-meters	1.365	metric tons	short tons	1.102
pound-inches	mewton-meters	.11375			

Temperature (Exact)

°F	Fahrenheit temperature	5/9 (after subtracting 32)	Celsius temperature	°C